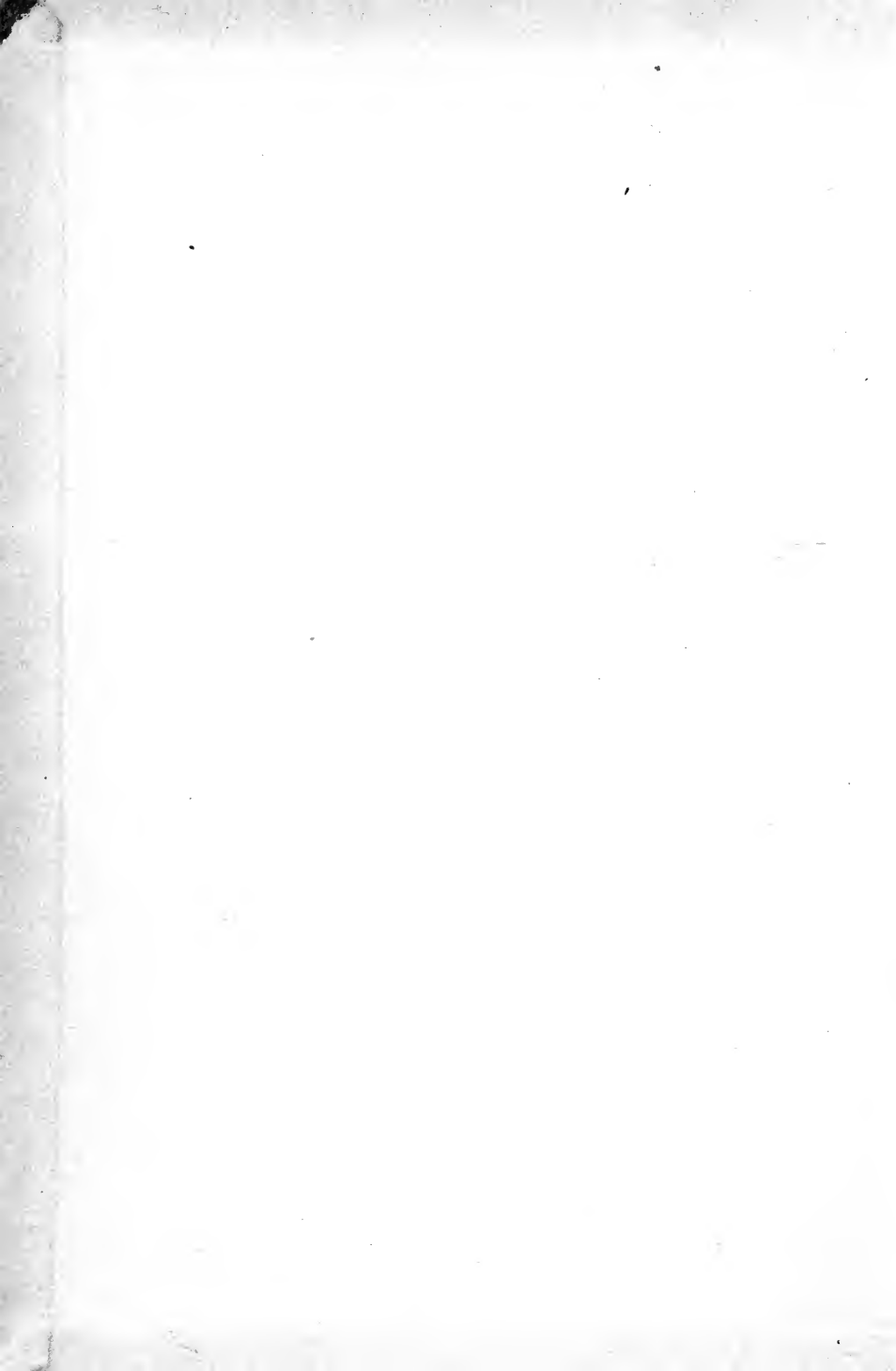


THE AMERICAN WAY

# OUR USE OF THE LAND

Ayers Brinser with Ward Shepard





K. D. Welch

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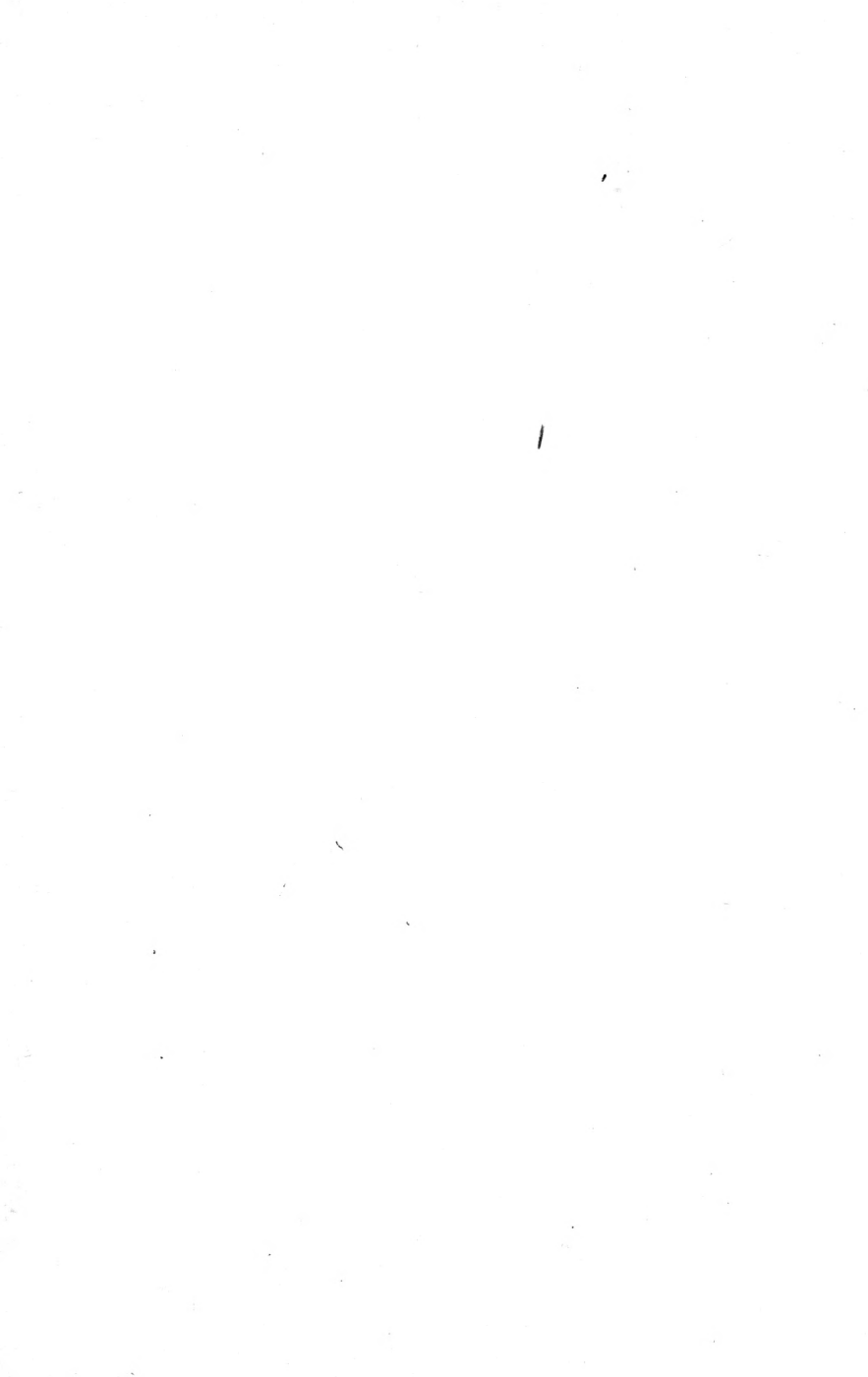




THE AMERICAN WAY

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## OUR USE OF THE LAND



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# OUR USE OF THE LAND

By

AYERS BRINSER

WITH THE ASSISTANCE OF  
WARD SHEPARD

DIRECTOR OF THE HARVARD FOREST  
HARVARD UNIVERSITY



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OUR USE OF THE LAND

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FIRST EDITION

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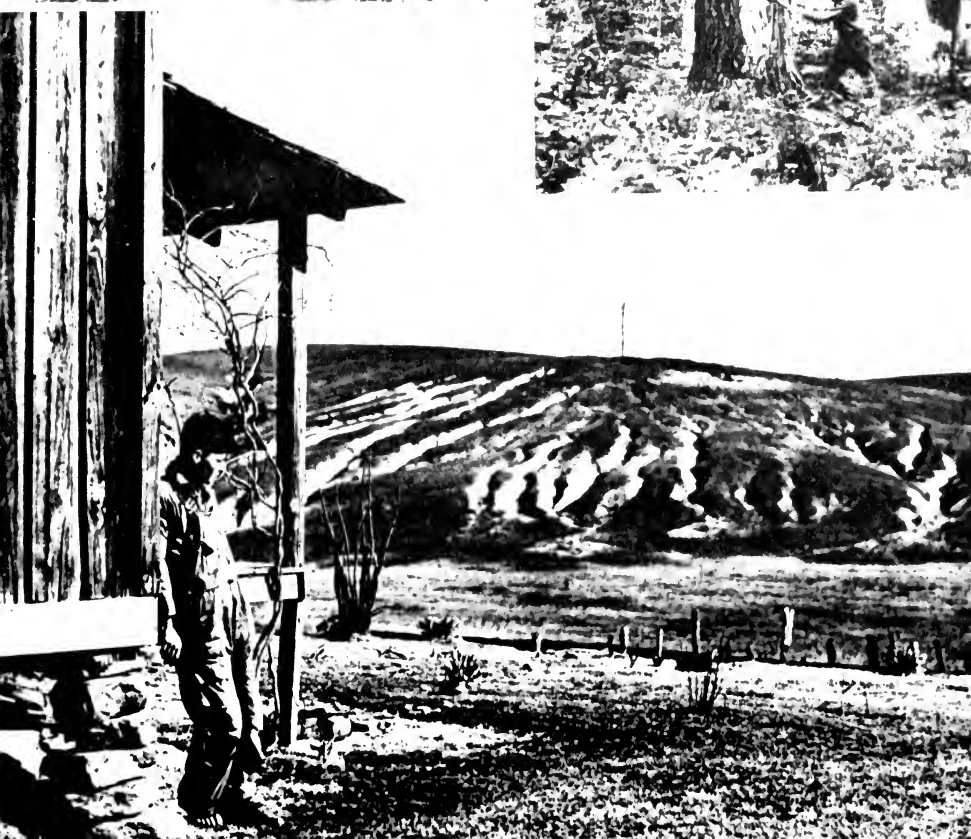
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(1, 4, 5, 6, 11, 12, 13, 14, 15, 16, 19, 21, 23, and 24 by courtesy of U. S. Soil Conservation Service; 2 and 18 by courtesy of U. S. Forest Service; 3, 7, 9, 10, 20, 22, and 25 by courtesy of Farm Security Administration, photos by Rothstein; 8 by courtesy of Farm Security Administration, photo by Lange; 17 by courtesy of Farm Security Administration, photo by Lee; 28 by courtesy of Division of Grazing, Department of the Interior.)

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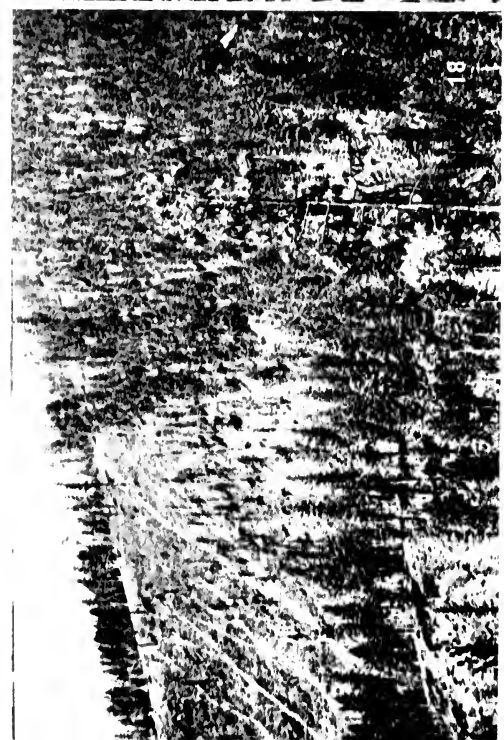
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Our present task is to adjust our institutions to a changing society and economy. Living in a democracy, we gain our salvation the hard way, by trial and error. Through excess of energy or sheer independence of spirit we have despoiled the resources that were our natural inheritance, and now must struggle to restore them or to conserve what is left. Having developed a technology which is the marvel of the world, we must teach ourselves and our children the knack of accident prevention in order to escape the physical consequences. In our pursuit of happiness we have utilized that technology to create untold wealth, only to produce widespread social insecurity in place of the anticipated prosperity for all. Because our schools are our greatest public trust, we have too often made them battlefields for conflicting interests and proving grounds for wasteful experiments. Because our press is free, we have used it heedlessly for the dissemination of propaganda and counter-propaganda. And yet, toilsome though constructive effort may be, we would not for anything change the procedure, for this is *our way—the American way*. In struggling toward more satisfactory answers

to our problems we are consciously exercising the initiative, the free choice, that is our birthright. We accept cheerfully the responsibility for our decisions.

"Surely education for life must follow life," says New York State's Report on the Regents' Inquiry,<sup>1</sup> "and the educational program, through the secondary school at least, should endeavor to rise above the artificial academic departmentalization which has characterized it in the past, and strive for a broad and life-like plan of study and growth." This same report anticipates the appearance of such a project as the AMERICAN WAY series when it refers to "the cooperative effort set in motion by educators to develop new and up-to-date materials which furnish the broad picture because they start with the common affairs of life, are scientifically accurate because they come from the joint efforts of specialists, and are readable because they are put into words by those who are skilled in writing for the intended users." It proposes further: "First, we must abandon the notion that education consists merely in learning facts. If it did, we should all be less and less 'educated' in proportion as the amount of knowledge is advanced. Education consists rather of the acquisition of broad understanding, the development of skill in associative thinking and generalization, the training in the retention and use of pertinent bits of experience and truth, and the cultivation of a rational, scientific, and ethical approach to the world and to life."

Each volume of the AMERICAN WAY series is a self-contained whole; each contributes to an understanding of the functioning of institutions in a democracy. For schools which prefer to organize their social studies programs around individual basic texts, any one of the AMERICAN WAY titles may serve as the core of a semester's work. For those with curricula calling for individual research and extensive reading, all the volumes will

<sup>1</sup> Luther Halsey Gulick. *Education for American Life. A New Program for the State of New York.* The McGraw-Hill Book Company. 1938. Pp. 29-31.

be valuable additions to the classroom library. The purpose of the series is one of introduction and orientation, suited to the needs and objectives of the early years of secondary school and preparatory to the consideration of logically organized subject-matter at higher levels. The junior high school pupil who has been brought to grips with such human problems as conservation, public opinion or security will have acquired the background which makes civics, economics and sociology meaningful. "By its intrinsic nature," says Charles A. Beard, "social science requires some picture of the process in which we live and work and when it is realistically conceived it must deal with what is here and now and also with what is emerging from the here and now."<sup>2</sup>

<sup>2</sup> Charles A. Beard. *A Charter for the Social Sciences*. Part I: Report of the Commission on the Social Studies. Charles Scribner's Sons. 1932. P. 56.



[illegible]

**I**n writing this book we had one main object in mind. This was to present the problems of land use as they are. Since the United States has reached maturity from the point of view of its resources, there have been periodical waves of what might be called conservation sentiment. This sentiment has supported the Forest Service, created an Arbor Day, and filled a great many people with righteous indignation. It is only recently that we have begun to create social and political institutions capable of reconciling the need for conservation and the necessity to make a living on the land.

The most valuable resource of this nation is the soil. Gold is more spectacular; iron has in two generations made men richer; copper has opened up greater possibilities of advancing techniques. But, it is the soil which produces the lasting and essential wealth of the nation.

We have spent three centuries in America, living and growing rich on our soil without really realizing how important it is to us. But we know now that we cannot go on in this prodigal fashion. Waste is cutting away the foundations of our economy. We realize that we must act to stop that waste.

The federal government is leading the program of saving and restoring the land. It has attacked the problem from two angles. It has tried to save the soil, and it has tried to revive the market for the products of the soil. This is a new departure in government in America, and if it is to become a part of our democratic structure it must be examined critically and with understanding as it develops.

If a citizen is going to make wise decisions about our growing program of land-use management, he must understand the

background of American land use. He must know the condition of the land, and the full implications in our present land-use methods.

This book is an attempt to supply such understanding in this way. In the seven phases of land use which we are considering here, we have tried to show why the problems have arisen, the extent of the problems today, the kind of controls which have been set up to solve these problems, and the meaning of these controls to the land and to the citizens who live on the land.

We do not think that the solution of these multifarious problems is simply a matter of saving resources. Rather, it is a question of intelligent use. Therefore, we have made no attempt to compile a complete list of our resources and the rate of their depletion. A catalogue of our land will not add to our understanding of it.

We could not pretend that this book is primarily an original document. It contains very little new material beyond that which comes from the author's personal observation of land use throughout the nation, and his experiences in working with the land. It is a synthesis of existing basic material, and an attempt to organize that material so that it will have meaning to those who must someday decide on our land-use programs.

This book is to show the government in action, attempting to solve one of our basic problems. It is an approach to the teaching of civics by treating government as a living force rather than as a series of dead categories. At the same time, it is intended to explain the problems of our resources in terms of their use. It is our hope that by combining these two subjects government will be seen in its dynamic relation to the people and the land.

Beyond these uses we hope that this book may serve yet another purpose, a purpose clearly stated in the concluding paragraph of Russell Lord's excellent book, *Behold Our Land*.

"But it is necessary and proper now to advertise this new calling—soil-healing—and its needs to young people who are wondering what to do with their lives. There is work here for you, if you will get the training. It will never make you rich, but it will support you; and it is real, vital, and absorbing work."

Our sincere thanks are extended to a number of government departments for their generous coöperation in giving us information. In the case of the Forest Service, the Soil Conservation Service, the Park Service, and the Indian Service, they provided the facilities to see at first hand many of the aspects of land use which would otherwise have been available only in printed reports. We are also indebted to these agencies for the criticisms which have helped to clear up many doubtful points. Among the many other government agencies to which the authors would like to express their indebtedness are the Bureau of Agricultural Economics, the National Resources Committee, the Division of Grazing, the Agricultural Adjustment Administration, the Farm Security Administration, Bureau of Mines, Biological Survey, Bureau of Fisheries, Geological Survey, and the War Department. In a like measure, we are also grateful for the assistance of Colonel William Greeley and Captain John Woods of the West Coast Lumbermen's Association, who provided us with information which was vitally necessary, and to Professors A. C. Cline and P. R. Gast of the Harvard Forest for valuable suggestions. Thanks are owing to the Harvard School of Public Administration for the use of research materials financed by the Social Science Research Committee.

It is important to acknowledge the author's sole responsibility for the facts and conclusions in this book. He sifted the material and synthesized it according to his beliefs. Any disagreement with what has been written here can be charged to him alone.

Mr. Shepard's assistance to the author has been invaluable.

He has given substantial aid in planning the book, in assembling and interpreting the complex materials and points of view in the broad field of land use, and in orienting the author's field investigations. These studies in the field on the part of the author involved more than 19,000 miles of travel to all parts of the United States, for purposes of first-hand observation and consultation with experts in all phases of land use.

A. B.



## OUR USE OF THE LAND

Forests, soils, grasslands, water, minerals, oils, fish, game, and scenic beauty are among the rich natural endowments of the area of the North American continent covered by the United States. Realization of the basic importance of these resources, determination to utilize them for the common good through long-range planning, and general knowledge of appropriate remedial and preventive conservation procedures are among the marks of the educated citizen. Since future welfare and safety depend on those things, the schools may well assume considerable responsibility for checking the ravages upon the heritage of the nation made by ignorance, indifference, carelessness, and unbridled selfishness.

—THE PURPOSES OF EDUCATION IN AMERICAN DEMOCRACY  
A Report of the Educational Policies Commission of the  
National Education Association



worked for generations. The yellow sub-soil of the North changed to a red sub-soil in the South, but the upper humus-bearing layer could be worked by the usual methods of tillage. Even though the changes in season were unexpectedly violent, there was, on the whole, little of which to complain.

First there was the Atlantic coastal plain, the plateaus back of that, and finally the Appalachian range which was the first dividing line between East and West. Here were a richness and variety of soils, game and furs for the early settlers, deep, safe harbors for the trading cities their grandchildren were to build. Beyond lay the broad valleys of the Mississippi River system, the land of great meadows and the great lowlands. The country was bigger, wilder but not altogether unlike the farmlands of Germany or England or France.

The Spaniards who entered the Great Plains and the southwest also found themselves in familiar country. These flat uplands with their gray mineral soil and bunchgrasses were not unlike the Spanish countryside. To the northeast of their settlements the prairies were an endless sea of tall waving grasses. North and westward lay the Rocky Mountains, huge shouldering masses of rock, up whose sides climbed great forests of pines, junipers, and firs. The snowcapped peaks of the Cascade Range and the Sierra Nevada presided over forests of gigantic redwood, sequoia, Douglas fir, incense cedar, ponderosa pine and Sitka spruce that ran down finally into the blue Pacific.

Now, think of this great area in terms of man. Before the white man came to what is now the United States, it was a vast, self-sufficient storehouse supporting a small Indian population and millions of wild animals. The land had long since reached a balance. The white man found in America a race that lived harmoniously with the land. The Indians "seemed to have none of the European's desire to 'master' nature, to arrange and re-create. They spent their ingenuity in the other direction; in accommodating themselves to the scene in which they found themselves. This was not so much from indolence

. . . as from an inherited caution and respect. It was as if the great country were asleep, and they wished to carry on their lives without awakening it; or as if the spirits of earth and air and water were things not to antagonize and arouse. When they hunted, it was with the same discretion; an Indian hunt was never a slaughter. They ravaged neither the rivers nor the forest, and if they irrigated, they took as little water as would serve their needs. The land and all that it bore they treated with consideration; not attempting to improve it, they never desecrated it."<sup>1</sup> But the white man brought with him the seeds of a civilization which has grown by consuming the land, that is, a civilization which has used up the land in much the same way that a furnace burns coal.

A map showing the progress of early settlement in the United States has a definite, moving pattern not unlike that made by the rising flood waters of a stream. At first the water finds the low places, flowing rapidly in long lines in the natural channels. When these channels are full, the water rises up the sides of the knolls and hillocks until finally the whole surface is covered or a few islands are left here and there.

The flow of settlement in America followed the same pattern. The channels which the first settlers followed were the areas of rich soils. As the rising tide of migration filled these channels the late comers had to go onto the poorer soils which lay on either side of the channels of rich land. And even today there are islands of unsettled land that stand out on the settlement maps like the island hilltops in a flooded valley. The borders of these islands are the shallow soils on which a large part of our under-nourished, under-privileged "sub-marginal" farm population is stranded.

«««««« »»»»»»»»

<sup>1</sup> Willa Cather, *Death Comes For the Archbishop*, Alfred A. Knopf, New York, 1928, pp. 236-7.

One fall day in the late 1720's a man in northwestern Massachusetts climbed a tree to get his bearings. To the east he saw the camel's hump of Mt. Wachusett. To the west was the dim outline of Greylock, the low rim of the Berkshires. The dark trough of the Connecticut Valley ran north and south where the ridges were spread widest. This man may have been John Bennett, or Jonas Houghton, or Jeremiah Perley, or Moses Hazen, or any one of the forty others who were out with Captain Lovell hunting Indians.

He didn't see any signs of Indians. But he did see great stretches of virgin pine, oak, spruce, chestnut, maple, hickory, hemlock, cherry covering a series of sharp valleys which rolled westward in a succession of green waves.

What the man said to his companions when he climbed down from the tree, or what they said to him of the fine timber they saw on the ground is not very important. Whatever it may have been, they promptly went on about their business of hunting Indians. A few days later, at the head of the Salmon River in New Hampshire, they came upon a sleeping band of ten Pequawkets on a hunting expedition. With their guns to their shoulders and dogs unleashed ready to pull down the first few Indians who tried to flee, the sixty colonists made short work of their game. They killed all but three in the first volley. For their ten scalps, Captain Lovell and his men received one thousand pounds from the Colonial government upon their return to Boston.

It was not long afterwards that John Bennett, Jeremiah Perley, and a large part of the remainder of this group sent a petition "To His Excellency Jonathan Belcher Esq<sup>r</sup> Captain General & Governour in Chief In & Over His Majestis Province of the Massachusetts Bay, the Hon<sup>ble</sup> the Council & Representatives in Gen<sup>l</sup> Court assembled at Boston." In this petition was set forth "the Hardship & Difficult marches they vnderwent as volunteers under the Comand of the Late Cap<sup>te</sup>

Lovell & Cap<sup>te</sup> White after the Inden Enemy and Into their Countrey." They asked "In consideration thereof to be favoured with the Grant of a township."<sup>2</sup>

Already there were glowing reports from the frontier. It was the Connecticut Valley in those days. Enthusiastic travelers told stories of deep, rich soil and wide fields. It was not by chance that the towns of this valley were called Springfield, Greenfield, Deerfield, Northfield, Westfield, and so on for a great many more "fields."

The Indian fighters got their land in 1733, the land that one of them had seen from the tree top when they had been on the march. Very few of the petitioners actually came to settle this new land. They were established, prosperous farmers to the eastward. Instead of coming themselves, they sent their sons and nephews, who were glad for a chance to go West.

By the fall of 1733 the first settlers had begun to fell the forests. A few logs were enough for the houses. The rest they piled on heaps and burned. They didn't know it, but they were destroying in those huge bonfires one of the most valuable crops that land was ever to produce.

In 1754 the little settlement became the town of Petersham. Within the next half century Petersham was a well settled community. There were 1,794 inhabitants in the village and surrounding country. Most of the land had been cleared. The unbroken virgin forest had been reduced to some scattered tracts of uncut timber. Farming was the major occupation of the people.

When the Revolutionary War broke out, the people of Petersham were about evenly divided, half Tories and half Rebels. Usually the townsmen and the richer farmers remained loyal to the crown. The less prosperous farmers supported the

<sup>2</sup> Address Delivered in Petersham, Massachusetts, July 4, 1854, in Commemoration of the One Hundredth Anniversary, by Edmund B. Willson. Crosby, Nichols and Company, Boston, 1855.

American side and some of them fought in the ranks of the ragged American armies.

The war was not over when Cornwallis surrendered at Yorktown. It still had to be paid for. One of the first things the new American government had to do was to pay its debts. Much of this money had to come from some kind of taxes on the farmers. Unfortunately for the farmers, money was scarce. Many of them couldn't pay the taxes, and as a result the courts took their land from them. The farmers who had fought for the Revolution felt that it was flatly unjust that their land should be taken simply to repay government debts to rich townsmen.

Under the leadership of Captain Daniel Shays, the farmers of the Petersham region gathered together in a large band. Armed with pitchforks and scythes, they set out to stop the courts from seizing their farms.

Very much upset by what was going on in the back country, General Knox wrote to General Washington of Shays' followers, "Their creed is that the property of the United States has been protected from the confiscation of Britain by the joint exertions of all, and therefore ought to be the common property of all. . . . This dreadful situation, for which our government have made no adequate provision, has alarmed every man of principle and property in New England."<sup>3</sup>

To quiet the fears of the men of principle and property, the militia was called out. Before breakfast one wintry morning, Shays and his army were routed and caught at Petersham. It is hard to tell what those men of property and principle would think if they knew that today a new state highway through this area has been named "The Daniel Shays Highway."

After the trouble with Shays had ended and the Constitution was adopted, the people of Petersham settled down to farming.

<sup>3</sup> Vernon Louis Parrington, *Main Currents in American Thought*, Vol. I, *The Colonial Mind, 1620-1800*, Harcourt, Brace & Company, New York, 1927, p. 277.



To most of them the future looked bright. They did not know that the decay which was soon to reduce this community largely to empty cellar holes and stone walls rambling through scrub timber had already set in.

However, it was not long before this decay was plain to everyone. The factory towns springing up on the fall line of New England rivers were drawing the young men and women away from the land. Those who wanted to work with the land found that the declining soil could not bring in as much money as a job in town.

And then there was the West, square miles of fertile black earth waiting only for the plow. As one man put it in 1817, "Old America seems to be breaking up and moving westward."<sup>4</sup> A man in Newburg, New York, noticed in a single July day six wagons with seventy persons, all from Massachusetts, on their way to a village in Ohio.<sup>5</sup> By 1838 the people who remained in Petersham did not think it at all unusual that Lewis Bigelow, who had been born and bred in the town, should die in such a far-off place as Peoria, Illinois. At this time a resident of Petersham could have found childhood neighbors in many western counties.

After the Civil War the United States grew like a young cat in a creamery. Men began to build factories, cut down forests, and break the virgin prairie sod in earnest. In Petersham, the old farms had nearly all grown up to second growth timber. The factories and the cities that sprang up around them were the market for this second growth. And when that was cut, about all that was left on many former farms was a bristle of alder, blueberry, and hardwood sprouts that would never be anything better than firewood.

The demand for lumber had brought a few people back to

<sup>4</sup> Harold Underwood Faulkner, *American Economic History*, Harper & Brothers, New York, 1935, p. 204.

<sup>5</sup> *Loc. cit.*

the land. But the real energy of the country went into building cities and fortunes in the East and taming the West. Forgotten towns of colonial days remained forgotten.

As the men who owned the factories accumulated their profits, they began to look for places in the country in which to spend their leisure. In those days, most Americans, regardless of where they were or what they did, liked to think of themselves as country boys at heart. And indeed, most of them were. They had sentimental memories of the colonial town sleeping in the elm shade, the white church with its tall spire presiding over the green common, the neat white houses with their clean lines, instead of the jig-saw frills of the houses men built in the cities to display their prosperity. Thus the little towns like Petersham that had sent its young men to the cities got back prosperous city men looking for a rest.

Petersham became a sort of open-air museum. The main purpose of the town was to be looked at. Here and there a stand of timber that had somehow escaped the axe when a third cut was made in the early 1900's was maturing into valuable saw logs. Occasional well-cared-for fields and a neat house marked the farm of some successful dairyman who sold milk to the surrounding towns.

But most of the farms were down at the heel, and most of the fields were barely holding their own, or growing up in scrub timber. Those who had no land could find a job in one of the factories in nearby Athol, or earn a few months' pay by doing odd jobs for "summer people."

The World War caused prices to go up a little in Petersham. A few people began to prepare land for farming again. However, the crash in farm prices that followed the War soon drove all but a few of these back to the work benches in the factories.

After the World War, towns like Petersham were in full retreat. Cash incomes shrank. Brush continued to crowd into

the fields. And some of those who had left to make their fortunes in the cities returned to the country to scrape together enough food to keep them off the breadlines.

The long story of the rise and decline of Petersham may seem to be out of place in a book on the use of land in the United States. True, what has happened in one small Massachusetts town is of little consequence to a rancher on the Staked Plains of Texas or a wheat farmer in Iowa, or a miner grubbing for copper in the backbone of the continent at Butte. But the story of Petersham illustrates what is happening to that rancher, and farmer, and miner today. Its history is in a small way the history of the land in the United States. It follows closely the pattern of American land use.

The outline of this pattern has been shaped by three powerful forces. These are, first, the point of view of the people; second, the requirements of economics; third, the laws of nature.

#### THE POINT OF VIEW OF THE PEOPLE

Men came to America for land. They may have left their native countries for political or economic or religious reasons. Whatever these reasons were, the people who settled America selected it as their home because they knew that here was land for them. Land meant freedom.

Unfortunately for their great great grandchildren, the early emigrants thought there was so much land in America that it made little difference how it was used. Any one of those emigrants who had ever looked at a map of this vast country could see with his own eyes that there would always be more land for whoever would want it. Had they not just read in Mr. Peck's *New Guide for Emigrants to the West* that "There is much fertile land in the Valley of the Missouri, though much of it must be forever the abode of the buffalo and the elk, the

wolf and the deer"?<sup>6</sup> Here was one valley so big it would never be filled with people.

They treated the land as if it were an inexhaustible mine. When the fertility of the soil was spent, the timber cut and burned, the fur-bearing animals dead, the ore veins empty, they moved on.

Everyone expected to get rich in the process; a few did. Those who didn't continued to move. But as the people exhausted the land and then went on their way, they always left behind them stranded on some rocky hillside a backwash of those who were less lucky or perhaps not so strong.

They were spending the savings nature had put into the land over a period of millions of years. But as long as there seemed to be plenty more, no one paid much attention to that.

There were a few men, however, who understood just what was happening to the land. It is not by chance that they were from the South, where continuous tobacco cropping had exhausted much of the soil and left it a prey to erosion. Patrick Henry, for example, is supposed to have said, "Since the achievement of our independence, he is the greatest patriot who stops the most gullies."<sup>7</sup>

In the early days, the South was the great agricultural region of the United States. It was quite natural that all the forces affecting land use should be most strongly felt there. William Strickland, a traveling Englishman, wrote in 1796, "A richer district by nature there cannot be, than are all those counties which lie at the eastern foot of the Blue Ridge; but, like whatever on this continent has been long cultivated, they are nearly exhausted."<sup>8</sup> "The case is," another observer wrote, "they (the Colonial farmers) exhaust the old as fast as possible till it

<sup>6</sup> J. M. Peck, *New Guide for Emigrants to the West*, Gould, Kendall and Lincoln, Boston, 1837, p. 35.

<sup>7</sup> A. R. Hall, *Early Erosion Control Practices in Virginia*, United States Department of Agriculture, Miscellaneous Publication No. 256, 1937, p. 2.

<sup>8</sup> *Ibid.*, p. 5.

will bear nothing more, and then, not having manure to replenish it, nothing remains but to take up new land in the same manner."<sup>9</sup>

In the middle colonies the pattern for land use was a little different. If we had taken Lancaster County, Pennsylvania, instead of Petersham, Massachusetts, as our example of land use in America, we should have reached a very different conclusion. Here was a belt of rich, deep limestone soil, plenty of moisture, and wide, flat fields. The colonists who settled there had come from similar soils in Germany. They knew how to treat such soil. Furthermore, their close knit religious and social life fostered a stable and efficient kind of land use.

Above all, they knew that the use of land was a never-ending partnership, a partnership between man and nature. The soil is not a mine to be exhausted and then abandoned. To the Germans of the Lancaster Valley, the land was a loan from nature to be used, improved, and then passed on to their children, and their children's children forever.

This is why the history of Lancaster County is vastly different from that of Petersham. Here there were no successive waves of prosperity and backwashes of poverty. Once a field was cleared, it rarely returned to brush. And if the son of one of these square, black-bearded farmers had moved to Peoria, Illinois, like Lewis Bigelow, the whole community would still be talking about it. The duty of a son in this region was and is to take over the land when his father retires to the "old folk's side of the house" to smoke his pipe in peace and give advice.

The land is a part of these farmers and their families. They know what they want, and they have a good idea of how to get it. That goal is stability. This is the reason that Lancaster County fields still produce as much wheat and tobacco and hay as they yielded two hundred and fifty years ago.

<sup>9</sup> *American Husbandry*, Vol I, p. 144. Quoted in Harold Underwood Faulkner, *American Economic History*, Harper & Brothers, New York, 1935, p. 73.

There is a second important reason for this continued prosperity of Lancaster County. The soil was so good that it abundantly repaid the conscious efforts of these people to treat it well. This brings us to the second of the three forces that control the use of land.

#### ECONOMIC CONTROLS OF LAND USE

The limestone soil of Lancaster County yielded rich crops. They gave the farmer money with which to pay his taxes, build his wide stone barns, buy what little he needed. The New Englander rarely had soil that was half as good as the Hagerstown limestone of the Lancaster Valley. The northeastern corner of the United States was the one area that did not produce a large surplus of agricultural crops at some point in its history. The soil was very stony and could be cleared for the plow only with immense labor. A large part of New England is best suited for timber growing, but the forests have never been well-managed, and so have contributed less than they could to farm income.

The southern planter was also at a disadvantage when compared with the Lancaster County farmer. He was beset with the problems which came from his large investment in land and slaves. To get money to pay his heavy expense, a planter tried to get everything out of the soil it would give. To have rotated cotton with a less profitable crop would have meant less money coming in at harvest. Not to rotate crops meant the inevitable destruction of the soil. The planter didn't raise enough stock to produce manure for his fields, and commercial fertilizers were unknown during the heyday of southern cotton. In the long run, the cotton planter either had to move to new land or fail. His prosperous days lasted no longer than the fertility of his rapidly declining fields.

From the point of view of economics, the most powerful force affecting the use of the land in the United States was the

tremendous industrial development after the Civil War. The direct results of industrial development were, first, the rise of commercial farming to feed the cities, and, second, the exploitation of a new kind of resource, the minerals that lay under the soil. The southern planter and later the wheat farmer and corn-hog raiser were commercial farmers; that is to say, they grew crops to sell. Food, clothing, and the other necessities, which the early farmers produced themselves, the commercial farmers bought. Their great interest was a crop to be sold for a profit. Before the time of commercial farming, the main idea of the farmer was to be self-supporting. He grew as much as he needed, bought as little as possible. The perfect farm from this point of view was that which completely supported the farmer and his family. From the commercial farmer's point of view, the perfect farm was that which produced the largest cash crop.

After the Civil War, the federal government tried in various ways to aid the commercial farmers who were just beginning at that time to grow numerous. At first, it was thought free land was the solution, and in a series of Homestead Acts the federal government gave away 275,400,000 acres of land.<sup>10</sup> Some of those who got this land grew rich. A great many others failed. Someone once said of these homestead laws that they were simply a wager—"the government bet a quarter section of land that a man could not live on it for five consecutive years."<sup>11</sup> The government won the bet more often than was good for the settlers. The chief reason for this was that much of the land offered by the Homestead Act was useful mainly for grazing. It was too dry for crop land, and 160 acres was not enough for a man to earn a living as a rancher.

By 1890 the largest part of the profitable farm land had been taken up by the settlers. Agriculture had gone through a series

<sup>10</sup> Parkins and Whitaker, *Our Natural Resources and Their Conservation*, John Wiley & Sons, Inc., New York, 1936, p. 23.

<sup>11</sup> Benjamin H. Hibbard, *History of the Public Land Policies*, The Macmillan Company, New York, 1924, p. 395.

of booms and depressions, two causes of which were the rise and fall of farm markets, and the invention of farm machinery. Each new boom had led the farmer deeper into debt.

Machinery made it possible to cultivate great stretches of what was formerly range and prairie. For the commercial farmer, the invention of farm machinery meant this: In 1830 without machinery, his great grandfather spent 183 minutes of labor to produce a single bushel of grain while in 1900, with machinery, he was producing that same amount of grain with about 10 minutes of labor.<sup>12</sup> Since 1909 farm efficiency has increased 30 per cent.<sup>13</sup> In the 1930's 19 farmers grew enough food to feed 66 non-farm people, while in 1787 the same number of farmers grew only enough surplus to feed a fraction of that number.<sup>14</sup> This meant that as commercial farming became more efficient, there was less opportunity for many farmers to sell their produce. A smaller number of farmers could supply all the food for the many new city dwellers.

The rise and fall of the prices of farm produce that came with commercial farming had this effect. When prices went up, the farmer borrowed money to buy new land and machinery so that he could raise more crops to sell. Then, when more grain and cotton and beef were raised than could be sold, their prices fell. The farmer was left stranded with his debts, and no money with which to pay them. He could see but one escape—to plant more so that in spite of falling prices his crop would bring enough money to pay his debts. But the more he planted the lower crop prices sank. The government was still giving away land, but by 1920 free land was no solution to the problem. Even if there had been good farm land

<sup>12</sup> Hacker and Kendrick, *United States Since 1865*, F. S. Crofts & Company, New York, 1934, p. 175.

<sup>13</sup> National Resources Board Report, United States Government Printing Office, Washington, December, 1934, p. 102.

<sup>14</sup> "The Farmer Looks Ahead," *Farmers' Bulletin* No. 1774, United States Department of Agriculture, 1937, p. 5.



available, it would have done the farmers no good. They needed not more land, but a larger market for their crops, and a method of borrowing money at a low interest rate.

During the administrations of Presidents Wilson and Hoover, laws were passed to make it easier for the farmer to borrow money, but these laws were not enough to make the farmers prosperous. Finally, in 1929, when industry suddenly collapsed, the farmer's last market, the American consumer, shrank to a record low.

Mr. Hoover attempted to solve the problem by a law designed to put up farm prices by buying surplus crops with federal money. That failed. When Mr. Franklin Roosevelt was elected President, he expanded Mr. Hoover's idea of keeping farm prices up. He paid the farmer to limit his crops so that there would be no surplus to force down the market price. As he saw the problem, "We need to give to fifty million people who live directly or indirectly upon agriculture a price for their products in excess of the cost of production. That will give them more buying power to start your mills and mines to work to supply their needs. They cannot buy your goods because they cannot get a fair price for their products."<sup>15</sup>

When the Hoosac Mills decision of the Supreme Court declared that the method of this crop limitation program was unconstitutional, a new law was drafted to aid the farmers by (1) paying them to conserve their soil, and (2) paving the way for diversified farming which would escape the evils of one-crop agriculture.

Thus in less than half a century the government had shifted from a policy of giving away land to a policy of paying people to save it. This new policy was a sign that America had entered a new era. The point of view that grew out of the belief that there would always be enough land was meaningless when

<sup>15</sup> Black, Nourse, and Rogers, *Three Years of the Triple A*, Brookings Institution, Washington, 1937, p. 424.

there was no new land. And the belief that one-crop farming, regardless of its effect on the soil or the market, is a profitable kind of agriculture, became equally meaningless when it ended in the universal bankruptcy of agriculture. These points of view in the many years of their supremacy had left a great scar on the face of the country. That scar was eroded, sand-blown, gullied, brush-covered land that had been laid waste on the march to the West. The question is whether that wasted land will shock people into adopting a reasonable policy of land use. Or will it simply be a sample of the fate of the whole American land?

If the industrial development of the United States indirectly caused a decrease in the fertility of the soil, its effect on other natural resources was even more powerful. It was soon clear that a man would get richer exploiting the resources which supplied industry, such as water-power, timber, and minerals, than he would by cultivating the soil, the resource of agriculture. The same set of ideas which led men to destroy the fertility of the soil for profit, believing there always would be more soil, was applied to minerals and timberlands.

The exploitation of mineral resources has been similar to the bleeding of the land. However, the effect on the owners of these resources has been quite different. The profits from the industrial resources were so large that even though a mine might eventually fail, the owner would have made enough money to buy his way into some other business. The farmer, on the other hand, rarely made such profits. He was dependent on his land not only for his fortune, but also for the bare necessities of life. When the land failed, he failed.

The beliefs of men and the changes in markets and prices have a great effect on civilization, but they mean nothing to nature. Nature must be dealt with according to its own rules, and not as men and money decide to deal with it. That brings us to the third force which controls the use of land.

## NATURAL FORCES CONTROLLING LAND USE

When people talk about nature, they may mean any one of a hundred different things. They may be thinking of forests, wild game, scenery, flowers, the weather, and so on. When we write about nature in this book we mean the forces which control the flow of rivers, the fertility of the soil, the length of the seasons, the amount of rainfall, the growth of plants, the richness of mineral deposits, the development of wild life. In short, we mean the laws that govern the destiny of the land and the plants and animals which live on the land.

The basic law of nature is balance. No matter what happens, nature will keep that balance. A fertile soil produces grass. A cow eats the grass. The manure produced by the cow restores much of the plant food that was taken from the soil by the grass, and helps to grow more grass. If a farmer sells this manure, or doesn't put it back on his fields, the grass gradually dies out. The cow produces less milk, and if the process goes on long enough, she starves. When this sort of thing happens, people are apt to say, "Nature has been thrown out of balance." That is a mistake. Nature has kept its balance. What has been thrown out of balance is the cow, and the man depending on the cow.

Nature does not give anything. It lends. It will continue to lend as long as the loan is returned. When nothing is paid back, nothing is lent. Nature keeps a constant balance between its income and loans. When the loans are not repaid, the borrower, man, and not the lender, nature, is eliminated. Anyone who ignores the balance of nature does so at his own peril. Nature will maintain its balance by overthrowing him.

Just such a conflict occurred in the town of Petersham. Three times men came and cut the timber as if it had been a stand of wheat. With their primitive farming methods, they mined the soil. And three times they were defeated. It was a

case of move or starve. They moved to new land and were defeated again. So long as they refused to obey the laws of nature, they were drifters.

This flight from defeat at the hands of nature has become an American tradition. As long as there was new land to which people could flee, there was a safety valve for discontented people on worn-out land. In places where men knew how to play nature's game according to the rules, they have managed to hold their land, if the man-made laws of economics did not interfere. But where men did not understand nature's balance, and where low returns and high costs caused men to exhaust the resources of the land, the people are in retreat.

Thus, because of a lack of understanding and because of unbalanced economic laws, gullies are eating into the fertile Piedmont, floods rush down the Mississippi Valley, arroyos yawn on the Great Plains, dust storms choke western corn and wheat farmers, cut-over forests create man-made deserts, abandoned mine pits stare out blankly from the sides of the mountains.

Good use of the land, keeping nature's balance, requires knowledge, skill, and patience. It would be folly to expect the average farmer, burdened with making a living for his family, to work out all the complicated methods of preventing soil erosion, or keeping up the fertility of pasture and range lands, or harvesting his timber in such a way that he always has a healthy, vigorous, growing forest. In fact, it is only since the turn of the century that the scientific experts have launched large scale research of land problems and have spent any real effort to make people aware of the waste of our land resources. And it is only since the destruction of the land has reached such tragic proportions that any adequate methods have been set in motion to help landowners to help themselves. The old Agricultural Extension Service was created primarily to teach farmers how to grow bigger and better cash crops. It was only with

the coming of federal agencies like the Soil Conservation Service and the Agricultural Adjustment Administration, that a vast nation-wide program of teaching landowners the elements of good, stable, diversified, profitable land use, and of helping them financially and technically was begun. And even this is only a beginning in what is likely to be one of our chief national activities for generations to come.

#### THE LAND AS IT IS

The frontiersman's axe cleared the fertile farmlands. His gun shot the game and defeated the Indian. His plow broke the plains and his barbed wire fence reclaimed it from the roving herds of cattle. The lumberman's saw cut down the forests. The miner's pick dug out the gold and copper and iron and coal. The fisherman's nets caught the fish. The oil prospector's drill found the pockets of petroleum. And money from England, Holland, Germany, Scotland, and the industrial East was poured into America to make it grow faster.

Perhaps the country grew too fast. Perhaps it expanded more than was necessary. In any case, practically all the land of the United States is now old. The period of youthful richness and fertility has at last come to an end. America still has vast wealth in natural resources, but now these resources must be handled wisely and carefully if they are to be preserved at all. We can no longer afford to waste them.

America is like a man who suddenly realizes that he has reached middle age. He can no longer play six sets of tennis, race for a quarter of a mile, and then dance until two in the morning. If he uses his energy wisely, he will be stronger and accomplish more than any young man. But he must concentrate his efforts on really important jobs if he is to survive. So must the United States use her energy, which is her natural resources, wisely. If Americans who work with the land learn to understand and abide by the laws of nature, the products of

the land can be made to yield enough profit to pay for its proper care. Then America can be made more productive than ever. If, on the other hand, the land continues to be destroyed, then the United States will have to depend on other countries for her food and minerals.

## SOIL LOSSES THROUGH CULTIVATION



GRASS

NEGIGIBLE



WHEAT



CORN



TALLOW



EACH CART REPRESENTS TEN TONS PER ACRE

PICTORIAL STATISTICS, INC.

When man tills the land he lays it open to the forces of erosion. The amount of soil lost annually by erosion on cultivated land depends on the crop that is planted.

Today in America there are about 78,000 square miles of farm land that have been ruined beyond repair. Another 234,000 square miles of land are so badly off that it will be a generation before they will be able to support men decently. It has been estimated that every year erosion consumes \$400,000,000 worth of soil and soil fertility. Annually, erosion takes from our soil twenty-one times as much plant food as do crops.<sup>16</sup> In the Great Plains alone there are 24,000 crop farms covering a total of 23,437 square miles which should no longer

<sup>16</sup> United States Soil Conservation Service, *What Is Erosion?*

be plowed.<sup>17</sup> Not only does erosion leave a rock-ribbed ruin behind, it speeds up run-off of rain water, causing more severe floods, and it sends soil down the rivers, silting up dams, covering and ruining the land of other farmers, and filling stream beds so that the spring freshets flood wider and wider areas every year.

On the grazing lands of the plains, the grass has been cropped heavily by the cattle. As a result, it is not unusual for land to be so poor that it takes two hundred acres to support one cow for one year. Where there is little grass there is little protection from the sudden torrential rains. Arroyos grow deeper and wider with every storm. About 75 per cent of the plains region has had its original dense carpet of nourishing grasses thinned out to a pitiful remnant.

Many millions of acres once covered with great forests have been changed into barren wastes and other millions of acres support second-growth forests of inferior quality. Of the original 1,281,250 square miles of virgin timberland, much of course had to be cleared for farms; but of the vast area that was left, only about 154,500 square miles remain today.<sup>18</sup> And still the sawmills are eating into these remaining forests as fast as they can, and mostly by methods that either prevent a new forest from starting or encourage only a poorly-stocked inferior second-growth.

Scientists estimate that there is only enough petroleum to last for eleven and one half years at the present rate of consumption and with the present methods of production. This does not mean that after eleven years we will have to throw away our gasoline engines. But as supplies grow scarce, our oil will have to come from oil shales and other low yield sources.

<sup>17</sup> *The Future of the Great Plains*, Report of the Great Plains Committee, United States Government Printing Office, Washington, D. C., December, 1936, p. 5.

<sup>18</sup> *Ibid.*, pp. 244-247.

The costs of getting oil in this way are higher than the costs of pumping it from wells. These new costs of production will have to be added to the prices of gasoline and other oil products. In other words, a diminishing supply of oil will mean increasing costs, unless better methods of producing oil from the low yield sources are invented. In the Texas Panhandle a billion cubic feet of natural gas are simply blown into the air every day. That is enough to light a city like Washington for 150 days. Copper, coal, iron, zinc, lead, nickel, all these minerals are slowly being exhausted. There are but a few minerals such as silica and aluminum of which the supply now seems to be sufficient for all time.

America has ceased to be a young country. Of this there could be no surer sign than the increasing control of land use by the federal and state governments. The United States Department of Agriculture regulates crops, combats soil erosion, promotes land saving programs, administers 170,000,000 acres of National Forest land and buys more land to create new National Forests, helps forest owners to reduce forest fires and grow timber as a crop, studies farm costs and prices, animal production, crop production and marketing.

The state and the federal governments protect wild life. Public lands are mostly closed to settlers. Under the Taylor Grazing Act 142,000,000 acres of the once free range have been put under restricted use.<sup>19</sup> Petroleum production is in part controlled and the government is seeking to increase this control. The Park Service cares for great scenic and wild areas that have been set aside as National Parks so that Americans can get some idea of what their forefathers really saw when they trekked across the continent. On top of this, the government is lending money to the farmer, insuring his crops against loss and low prices, promoting foreign markets, assisting families stranded on sub-marginal land, reclaiming new

<sup>19</sup> *Future of the Great Plains*, op. cit., Appendix II, p. 176.



areas for those who have been left behind on poverty-stricken soils.

All the while government boards are gathering information to find out what to do next. There are planning boards for the best use of natural resources. Investigators are writing reports on farm tenancy, the timber supply, the quality and use of soils, and so on.

This phase of the government's activity in agriculture solves only a part of the great problem of land waste. It cannot bring about true and wise land use until the people who use the land understand it. It is for this reason that the government is laying such great stress on organizing the people themselves for good land use. The Agricultural Adjustment Administration county and state committees and the Soil Conservation Districts are examples of the development of new institutions of education and self-help in which the farmers learn how to use the land better and work toward a more stable type of agriculture. Land exploitation is now being succeeded by land management. As the government and the settlers were partners in the first phase, so again they are partners in the new phase. From now on it will have to be a coöperative effort for the common good, rather than a helter-skelter scramble for riches, and devil take the hindmost. Too frequently he did.

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#### PROJECTS

1. See if you can find out the value of manufactured products in your town and the value of agricultural products brought into your town. If you live in the country, see if you can find out the value of the agricultural products sent to the city from your area.
2. See if you can find out how many people in your area move from the country to the city and how many move from the

city to the country. You can get this information from the headquarters of your city or county government. See if you can discover any relation between the movement of people from the city to the country or vice versa, and the value of farm products produced in that region.

3. If you can get a soils map of the United States, which is a map showing the major types of soil in the United States, see if you can trace on this map the route followed by the majority of the early settlers in your region when they came from the eastern seaboard. Does this route follow any particular type of soil?

4. Check up at home and find out just what food you eat in a week. Now find out from some older person how your list compares with what was eaten some twenty-five years ago. How would this change in diet affect the farm problem?

5. It has been said that 50 per cent of the people of the world go to bed hungry. Make a list of what you consider to be the reasons for this.

6. Many of the older towns in the United States were named so because of certain characteristics of the land. In New England, open fields were much sought after. Hence when the settlers found fields they were apt to give the town some such name as Deerfield, Springfield, or Greenfield. Black walnut trees growing on river-bottom land was a sign of good soil to the Pennsylvania-Germans. Hence in Pennsylvania there is a town called Walnut Bottom. See if you can find place names in your neighborhood which indicate some quality of the land. Check up to see if the land still has this quality.

7. Many early settlers as they moved westward followed the line of good soils, rather than the more direct and easy routes. As a general rule the farmers followed the soils while the tradesmen, artisans, and hunters took direct routes like the rivers. Find out how the first settlers came to your region. Does the way they came indicate their reason for coming?

8. What is the major use of land in the area in which you live? Is it farming, mining, lumbering, production of water power? Find out when this use began. Is the basic resource upon which your community depends still plentiful? Whether it is or is not, try to find out why.

## DEBATES

Here are some topics that could be used for debates.

1. Is the farmer justified in exhausting his soil in order to make a large profit and then move on to new and unspoiled land?
2. Is commercial farming a better type of farming than subsistence farming?
3. Are low prices and a bad market more of a cause of bad farming than ignorance?

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## THE FARM LAND

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sounded to the farmers left landless by this law. "It [Virginia] is the goodliest and most pleasing Territorie of the World." "[There is] such luxuriant plantie and admirable raritie of trees, shrubs, hearbs; such fertilitie of soyle . . . opportunitie of habitations, hopes in present, hopes of future," that one had to see it to believe it.<sup>3</sup>

With such advertising, it was not long before settlers were coming to America by the thousands. Not only English, but German, Swiss, Dutch, French, men of all kinds fleeing from poverty, oppression, famine, war, to the rich, plentiful land of America. Had that staunch Puritan, Francis Higginson, lived another hundred years he would have taken back his lament: "Great pity is it to see so much good ground for corn and for grass as any is under the heavens, to be altogether unoccupied."<sup>4</sup>

## SECTION I

For centuries before the colonists came, the Indians had been growing crops after a fashion. They raised Jerusalem artichoke, many varieties of beans, peas, red peppers, corn, grapes, onions, pumpkins, squash, cotton, and tobacco. It has been estimated that they produced at least 1,000,000 bushels of corn a year.<sup>5</sup> In 1794 General Wayne writing from Ohio of the Indian agriculture said he had never "before beheld such immense fields of corn in any part of America, from Canada to Florida."<sup>6</sup>

It was the Indians who gave the colonists their first introduction to American agriculture. The friendly Squanto showed the Pilgrims how to grow corn, "ye manner how to set it, and after, how to dress & tend it."<sup>7</sup> Unfortunately, the earlier set-

<sup>3</sup> *Ibid.*, pp. 57, 58.

<sup>4</sup> *Ibid.*, p. 55.

<sup>5</sup> Faulkner, *op. cit.*, p. 61.

<sup>6</sup> *Ibid.*, p. 60.

<sup>7</sup> *Ibid.*, p. 63.

tlers did not learn to improve on the primitive Indian methods of cultivation. Furthermore, most of them soon forgot the knowledge of good land use which had been a part of their traditions in Europe. The American soil seemed so abundant that careful use appeared to the colonists to be a waste of time.

With the exception of a few communities like those of the Germans in Pennsylvania, the farming methods of the colonists were ruinous. Frequently trees girdled to make way for crop land were left standing until they fell down. Land was cropped until it gave out and then a new piece was cleared. Cattle and hogs were allowed to roam at will.

Sarah Kemble Knight wrote this account of a New England farmhouse which she passed on her journey to New York in 1704: "This little Hutt was one of the wretchedest I ever saw a habitation for human creatures. It was suported with shores enclosed with Clapboards, laid on Lengthways, and so much asunder, that the Light comes throu' everywhere; the doore tyed on with a cord in place of hinges; the floor the bear earth; no windows but such as the thin covering afforded, nor any furniture but a Bedd with a glass Bottle hanging at ye head on't; an earthan cupp, a small pewter bason, A Bord with sticks to stand on, instead of a table, and a block or two in ye corner instead of chairs. The family were the old man, his wife and two children; all and every part being the picture of poverty. Notwithstanding both the Hutt and its Inhabitance were very clean and tydee."<sup>8</sup>

In the southern rural sections conditions were not much better. William Byrd, half in seriousness, half joking, wrote this about what he saw in North Carolina: "Indian corn is of so great increase, that a little Pains will Subsist a very large Family with Bread, and then they may have meat without any

<sup>8</sup> Sarah Kemble Knight, *The Private Journal kept by Madam Knight on a Journey from Boston to New York in the Year 1704*, quoted from Parrington, *op. cit.*, Vol. I, p. 138.

pains at all, by the Help of the Low Grounds, and the great Variety of Mast that grows on the High-land. The Men, for their Parts, just like the Indians, impose all the Work upon the poor Women. They make their Wives rise out of their Beds early in the Morning, at the same time that they lye and Snore, till the Sun has run one third of his course, and disperst all the unwholesome Damps. Then, after Stretching and Yawning for half an Hour, they light their Pipes, and, under the Protection of a cloud of Smoak, venture out into the open Air; tho', if it happens to be never so little cold, they quickly return Shivering into the Chimney corner. When the weather is mild, they stand leaning with both their arms upon the corn-field fence, and gravely consider whether they had best go and take a Small Heat at the Hough: but generally find reasons to put it off till another time."<sup>9</sup>

Agriculture in the South began with one great handicap—the determination of the early settlers to mine great and sudden riches from the soil. At first there had been "no talk, no hope, no work, but dig gold, wash gold, refine gold, load gold."<sup>10</sup> The colonists soon learned in the hard school of starvation that the true richness of that land was not to be found in gold mines, but in the earth. A few years later the Governors of the Virginia Company were complaining that "there had been but little returned [to England] worth speaking of save Tobacco and Sassafras, which the people there wholly applying, had by this misgovernment reduced themselves into an extremity of being ready to starve."<sup>11</sup> The reason tobacco was selected as a crop was that for the same amount of labor and time, tobacco would yield six times as much profit as grain. One man

<sup>9</sup> W. K. Boyd, *William Byrd's Histories of the Dividing Line*, North Carolina Historical Commission.

<sup>10</sup> Charles A. and Mary R. Beard, *The Rise of American Civilization*, The Macmillan Company, New York, 1935, p. 39.

<sup>11</sup> Andrews, *op. cit.*, p. 153.

was able to make as much as \$75,000 in present currency in one year growing tobacco on his plantation.

But if tobacco made some men rich, at the same time it made the soil poor. Since few tobacco farmers understood the use of green manure and organic fertilizers they had to move to new land every few years. This meant that as the colony advanced it left in its wake thousands of acres of worn-out soil.

In the South the introduction of crops like cotton and indigo in the eighteenth century hastened the development of the large plantations. This was an agricultural economy that required a large number of slaves, a great investment in land, and much money for operating expenses. Southern farmers, like those of New England and the middle states, who had no capital but their time and strength, were pushed back to the Piedmont Plateau, the western frontier of that day. The struggle over slavery, in one sense, was a struggle between these two competing types of land use—the great slave-worked plantations and the small freehold farm.

It was in Pennsylvania that the small farms first flourished. From 1763 to 1766 Pennsylvania exported £618,000 of farm products, nearly £200,000 more than her nearest rival, New York.<sup>12</sup> The greatest part of this sum was made up of grain which came from the rich valley around Lancaster. There the gently rolling hills were checkered with fields of ripening wheat, rye and buckwheat. The great limestone barns were filled at harvest. In the fall there was a steady stream of Conestoga wagons carrying grain to markets down the Lancaster Turnpike. All of this was the first American example of good land use. Land was permanent. And today that land is still an island of fertility in the center of many worn-out areas of the East.

#### THE WESTWARD MARCH BEGINS

Unfortunately, this idea of the permanence of land did not become the basis of American agriculture. If a man mined the

<sup>12</sup> Faulkner, *op. cit.*, p. 116.



soil so he couldn't make a living in one place, he would move on and try his luck elsewhere. He might go to Pennsylvania, New York, perhaps, or with Manasseh Cutler to the Connecticut Reserve in Ohio. Southerners followed Boone's trail out to the Kentucky bottom lands. Many poorer farmers drifted into the Northwest Territory where they did not have to compete with the rich slave owners.

In 1763 the English Parliament passed the Quebec Act forbidding the colonists to settle west of the summit of the Alleghenies. Supposedly, this act was to protect the Indians from the whites. Actually, it was a law to protect the English fur traders from the advancing American trappers and farmers. To many restless Americans the Revolutionary War was fought to win that land. Adventurous men didn't wait for the issue to be decided, but set out to settle this country, redcoats or no redcoats. Thus the first trickle of settlers began. After the war the trickle became a flood.

In Auburn, New York, a traveler noticed that all winter long the roads were crowded "with flitting families from the Eastern States."<sup>13</sup> In Pennsylvania they streamed west through the Cumberland Gap, down into Kentucky and Tennessee and south over the Appalachian plateau. Over the same route came Southerners seeking always new land. The federal government, noticing the value of Pennsylvania's Lancaster Turnpike, decided in 1806,<sup>14</sup> after much urging from the West, to build the Cumberland Road into the Ohio country. One man looked on this great highway and saw "As many as twenty four-horse coaches . . . in line at a time on the road, and large, broad-wheeled wagons, covered with white canvas stretched over bows laden with merchandise and drawn by six Conestoga horses, were visible all day long at every point, and many times

<sup>13</sup> J. B. McMaster, *History of the People of the United States from the Revolution to the Civil War*, Vol. IV, D. Appleton-Century Company, New York, 1895, p. 383.

<sup>14</sup> Faulkner, *op. cit.*, p. 330.

until late in the evening, besides innumerable caravans of horses, mules, cattle, hogs, and sheep."<sup>15</sup>

In 1678 the far west was Deerfield, Massachusetts. In the next generation it was Pittsburgh. Then it was Ohio, the Mississippi, Fort Defiance in Missouri. When the frontiersmen reached the plains country, they were temporarily stopped. They did not know how to deal with the grasslands, so they skipped them and began working eastward from the Pacific Coast. Then there were two frontiers, the Sierra Nevadas and the eastern edge of the Great Plains. Slowly these settlements came together like huge pincers. Today there is no longer an American frontier.

During the western explorations, the quality of the soil was the first interest of the explorers. When Pyncheon returned to Roxbury from his journey to Connecticut, when Boone came back from Kentucky, when Moses Cleaveland returned from the Connecticut Reserve in Ohio, when Lewis and Clark reached home after their journey to the Pacific, the first thing the average man asked was, "What are the soils like? What will they produce?"<sup>16</sup>

The beginning of the westward migration in the late eighteenth century was the beginning of the great period of American agriculture. That is why soil was so important. The madness of looking under every stone for a gold mine, which had almost caused the settlers of Jamestown to starve, had passed. It would be another three-quarters of a century before industrial America would be sending out prospectors to scour every hill and river bottom for mineral wealth. The search for good soil explains why the route of migration rarely took the easiest way west. For example, west-bound caravans shunned the quick route to the Ohio Valley through the Great Kanawha

<sup>15</sup> *Ibid.*, p. 331.

<sup>16</sup> A. P. Hulbert, *Soil, Its Influence on the History of the United States*, Yale University Press, New Haven, 1930, p. 69.

Gorge. Instead they took the more difficult route which followed the line of good soils. This was a finger of Hagerstown limestone that stretched south and west into the Tennessee Valley.

#### THE FIRST FEDERAL LAND POLICIES—EAST VS. WEST

When England finally ceded to the United States the vast country between the Alleghenies and the Mississippi, and Maryland had forced the large seaboard states to give up their claim to it, the land problems of the federal government had just begun. How was this territory to be settled? From the beginning of the Revolution the government believed that the great area of unoccupied land was a valuable source of wealth with which to pay soldiers. In the dubious days of the Revolution, the Continental Congress used the public domain as a bait for enticing deserters from the British Army into the American ranks. This plan was used particularly to win over the Hessians. The American government's offers of land were printed in German on the backs of tobacco wrappers.<sup>17</sup> A large portion of the pay of the Continental Army had been simply a promise of land. That practice of giving federal land to soldiers has continued up until the present time, for war veterans are still permitted to take up government land with much greater ease than other people.

In distributing the vast public domain, Congress was divided between two points of view. On the one side was the opinion of Alexander Hamilton and those who represented the traders and manufacturers of the East. They thought federal land should be sold to raise revenue to pay the costs of government. If tariffs were to raise government revenue, so should the sale of government lands. Besides, they said, our factories which are now beginning to thrive behind the protective wall of the tariff need more and more cheap labor. If

<sup>17</sup> Hibbard, *op. cit.*, p. 118.

there is to be free land in the West, the workers will leave the East and settle in the West. Everyone knows that scarce labor means high wages and high wages will ruin the factories.

On the other side were men from the West, men who had gone out and settled these new regions. At first their voices were too weak to be heard in Congress, but it was not long until the West became strong enough to send Andrew Jackson to the White House. And it was Thomas Benton, "Old Bullion" Benton, Senator from Missouri, who became their most vigorous spokesman. One western Congressman stormed, "The old states want the land in the new to bring the highest possible price, that they may have annually more money packed over the mountains, to be spent among them on their wharves, lighthouses, buoys, and breakwaters, and the Lord knows what; not satisfied in placing on our shoulders a protective tariff on the necessities of life for their benefit, we must also be saddled with a high land tariff, a sort of English corn law, that they may thrive and fatten at our expense, and most generous souls! when they were kind enough to modify the tariff in 1832, to save the Union, a reduction at that time of the land revenue never entered into their imaginations; no, never."<sup>18</sup>

Westerners agreed that the important thing was to settle the West as quickly as possible. They believed the best way to do this was to sell land as cheaply as possible. "Vote yourself a farm"—that was the best solution. Southerners were the allies of the West. They too wanted cheap land, but for a different reason. Planters wished to buy large tracts of western land so they could move their plantations west from the coastal region as the soil was exhausted.

In 1785 the first federal land disposal act offered the public tracts of 640 acres for \$1 an acre. The law required that half

<sup>18</sup> *Congressional Globe*, Twenty-sixth Congress, Second Session, App., p. 65, quoted from Hibbard, *op. cit.*, pp. 297-298.

the value of the land was to be paid in thirty days and the remainder within a year. At the first sale at government offices in Pittsburgh not 50,000 acres were sold, while at the Philadelphia land office not an acre was sold.<sup>19</sup> One of the chief reasons for this failure was the fact that states were underselling the federal government. Massachusetts was offering land at 50 cents an acre at the same time that the government was trying to sell its land at \$1 an acre in Ohio.<sup>20</sup>

The western states, which had been given land to sell to pay for schools, were also selling their land for considerably less than the prices fixed for federal land. Later, when federal land grants were made to pay for roads and canals in the new states, Congress fixed the minimum price for sale of such land at \$1.25 an acre. This was the first step taken by the federal government to prevent underselling by the states.

In addition to this cheap state land, 10 million acres had been purchased by speculators, some honest, others dishonest. To keep the speculators from getting any more land, the government raised its price to \$2 an acre in 1796. This was like locking the stable after the horse is stolen. With their 10 million cheap acres bought at from 10 cents to two thirds of a dollar an acre, the speculators could afford to undersell the government whenever they chose. As a result, from 1798 to 1800 the federal government got from its sale of land just about enough money to pay for an average farm in Ohio today.<sup>21</sup>

The methods of the Rev. Manasseh Cutler were not untypical. He was the lobbyist for General Rufus Putnam's Ohio Company of Revolutionary War veterans. To Congressmen he said in effect, "You want revenue. We'll give you that revenue if you will sell us a large tract of several million acres for less than the market price, and if you will give us time to

<sup>19</sup> McMaster, *op. cit.*, Vol. III, p. 120.

<sup>20</sup> Hibbard, *op. cit.*, p. 43.

<sup>21</sup> *Ibid.*, p. 210.

pay." Cutler pointed out to legislators that the government was weak—witness Shays' rebellion, which may have been merely a threat of what was to come from the rabble. And then everyone knew that the government was hard-pressed for money. There was the war to be paid for and the states refused to make their payments. Cutler promised that if he were given enough land at his price, he would be able to return to the government a good \$4,000,000.<sup>22</sup> Actually the Ohio Company paid to the government only \$500,000, but it got the land.<sup>23</sup>

Another problem the government had to face was what to do with squatters. Squatters were men who believed that western land belonged to the people of the United States. The idea that it should be paid for seemed utterly ridiculous. After all, they asked, why did we fight the Revolutionary War? What were Clark's men doing at Vincennes, Kaskaskia, and Kahokia—fighting for the privilege to *buy* land?

Squatters usually had no other title to the land than their "tomahawk claims." These were tomahawk blazes on the trees that marked their boundaries.<sup>24</sup> As one government agent complained of the squatters, their number was "immense."<sup>25</sup>

The result of this was that purchasers of government land frequently found it already settled. It was no easy task to remove these settlers, who felt that they had as good a right as anyone to the land. If you went up to a squatter who had waded through icy water up to his neck at Vincennes with Clark, and said, "I'm sorry, I've just bought this land from Congress—you'll have to move," he would probably reply, "Well, if Congress sold it to you, Congress'll have to come out here and put me off if they want to close the deal." Just how acute this problem was can easily be seen from the fact

<sup>22</sup> *Ibid.*, p. 47.

<sup>23</sup> *Ibid.*, p. 50.

<sup>24</sup> McMaster, *op. cit.*, Vol. III, p. 108.

<sup>25</sup> *Ibid.*, p. 107, note.

that in 1805 there were 442 farms in Michigan Territory and, of this number, but eight had a clear title to the land.<sup>26</sup>

This was the cause for the continuous agitation from the West for preëmption. A preëmption law would permit squatters to purchase the land upon which they had settled at terms similar to those given to the people who bought land in the usual way.

#### TRIUMPH OF THE WEST

Whatever may have been the merits of the eastern point of view that government land should be sold for a good price and the population concentrated in the East to supply labor for industry, eastern legislators were unable to prevent the great westward migration. East of the fall line the population was almost stationary for several decades before the Civil War, while the population of the frontier states grew by leaps and bounds. In the thirty years from 1790 to 1820, the seaboard states had sent almost two and one half millions of their citizens to the West.<sup>27</sup>

By 1854 a settler could get land by purchasing it from the railroads, which had been given great tracts of federal and state land; from the states, which had been given federal land for internal improvements and schools; from speculators, who had bought land from the state and federal governments; from the federal government, or by preëmption. The eastern idea of selling western land to raise government revenue had failed. Nothing showed more clearly how much of a failure it was than this fact—until 1832 the sale of federal land had brought in but \$38,000,000, while the revenue from tariff for the same period was \$556,000,000.<sup>28</sup>

The land act of 1854 was a victory for which Senator Ben-

<sup>26</sup> *Ibid.*, p. 141.

<sup>27</sup> Faulkner, *op. cit.*, p. 356.

<sup>28</sup> Hibbard, *op. cit.*, pp. 296-297.

ton and his supporters had been fighting for a generation. This act offered for sale, at cheap rates, land which the government had been unable to sell for ten years or more. Land that had been on the market for thirty years or more was offered for as little as 12½ cents an acre.<sup>29</sup>

After the West and South had at last succeeded in getting a public land policy that suited them, there was still the problem of speculators to settle. Between 1854 and 1862 when the Homestead Act giving land to settlers was passed, 25,696,000 acres were sold for \$8,207,000. This was an average price of 32 cents an acre.<sup>30</sup> A large share of this land was bought by speculators and later sold to farmers at from \$3 to \$10 an acre. It did no good to sell land cheaply if farmers in the end had to pay \$10 an acre for it. The whole point of cheap land was to draw settlers, not speculating companies, into the West. As the Dubuque (Iowa) *Daily Republic* put it in 1857, the trouble with speculators was that they produced "more poverty than potatoes and consume(d) more midnight oil in playing poker than of God's sunshine in the game of raising wheat and corn."<sup>31</sup> The rough and tumble methods of the speculators were governed by a single rule—"Get the land cheap and sell it high."

#### THE LAND GROWS SCARCE

As the population spread westward, good land became scarce. This was something only a few people outside the West understood then, or understand today. If you look at a map showing the distribution of the population of the West, you will see in such states as Nevada great vacant spaces. True, there is still a lot of room for people in the United States, but it takes more than room to support a family. The

<sup>29</sup> Hibbard, *op. cit.*, p. 300.

<sup>30</sup> *Ibid.*, p. 303.

<sup>31</sup> *Ibid.*, p. 223.



land must have sufficient water, it must be fertile, there must be a market at hand for its products. In the United States today most of the land which has these three assets is already occupied. The greater part of the unoccupied lands is valueless for farming because it lacks enough water or fertility. Water can sometimes be supplied and to a certain extent so can fertility. But the cost of supplying these is frequently so great that it more than outweighs the value of the crops produced.

In the 1860's there was plenty of free land that had water and fertility but that lacked nearby markets. If a market could be found for potential products of the great untouched prairies and ranges of the West, they could support thousands of people. To bring that market to this area the railroads were being built as fast as Irish laborers and Chinese coolies could spike down the tracks. However, the fact that the railroads were opening up great areas of land did not keep the price of land down. Prospects of waving grain fields in the midst of virgin prairies excited the people so that they were willing to pay higher and higher prices. New land could not be opened up fast enough to meet the demand. For the speculators, these high prices were like so much honey to a swarm of flies. They scrambled for everything they could get.

A reporter of the Dubuque (Iowa) *Daily Republic* told just how much of a scramble this was. "Since the last issue of the *Democrat*, a great excitement has prevailed throughout our town. At 6 o'clock, Saturday evening, many of our prominent citizens seated themselves at the door of the Land Office, that they might secure, in season, the door for the Monday morning following. Before break of day on Sunday morning, some fifty had gathered upon the steps and registered their names in a book. This little band continued to hold its own till afternoon, when many more were added. Evening came and still larger numbers gathered. . . .

"Outsiders, finding themselves thwarted on every hand, resolved to make one general rally, and if possible, crowd those at the door up so hard that they would yield their positions. At one time scores would rush up against them in front, then on the sides, then upon the front and side at the same time.

"These operations were continued, and were for the most part unsuccessful, from about five until nearly eight A.M., when more harsh means were used. We passed the office at about seven, and saw many who were nearly exhausted from fatigue, having stood upon their feet thirty-six hours. A constant agitation and clamor was kept up by the crowd on the outside, and a continued pushing inside, until many were so crushed that they fainted, and were thought to be dying.

"Window panes were broken out from a tier of lights above the door, and several buckets of water thrown upon the fainting ones below. The Register, seeing many were likely to be killed, and others badly injured, went upon the roof of the building and declared that none who pushed or crowded should be served that day. This served to produce the desired effect upon many; others were so wrought up that they almost felt desperate.

"At nine o'clock the door opened, and many fell prostrate and nearly helpless upon the floor. To sum the matter in brief, we have never seen a more distracted and desperate set of men than were about that office. All were armed, and resolved to defend themselves to the last."<sup>32</sup>

If a land purchaser managed to get out of this alive, whole, and with the deed to a parcel of land, his troubles quite often had just begun; that is, if he intended to farm the land himself. The farmer's problem was how to oust the squatter who was likely to be found living on the land. Many people discovered that in buying land they had unwittingly become "land pirates" or "claim jumpers."

<sup>32</sup> *Ibid.*, p. 109.

Occasionally the original squatter would gather together a group of his friends and pay a visit to the "jumper." He would take along a Justice of the Peace armed with a document for the "jumper" to sign. This document declared that the "jumper" had willingly turned over to the squatter the land he (the "jumper") had just purchased. "It was not unusual for the members of this committee to carry guns and ropes and to indulge in remarks calculated to stimulate the claim jumper in his tendency toward a speedy and amicable settlement. Very rarely did he resist vigorously, but once in a while it required heroic measures to overbalance his greed. The story is told of one 'jumper' who resisted, and addressed the committee in irreverent terms, daring them to do him physical injury, and threatening to bring the strong arm of the law violently down upon their heads. The committee exhausted their verbal arguments in vain; then, putting a rope around the waist of the culprit, led him to a pond, cut a hole in the ice, and immersed him. He was soon drawn out, but, being still in a combative and profane frame of mind, was treated to another ducking, and on his second coming out was unable to continue his side of the debate; so the negative was declared closed, and, after returning to the house, the dripping defender of that side set his signature to the papers and with uplifted right hand swore that it was his 'voluntary act and deed.' The squatter usually agreed to refund the money advanced by the 'jumper' but custom allowed him to take his time to it and no interest was paid."<sup>33</sup>

## FREE LAND

In 1862, during some of the most trying days of the Civil War, Congress took time to pass three laws which they thought would put agriculture on a firm foundation. The first of these three, which were immediately signed by President

<sup>33</sup> *Ibid.*, p. 207.

Lincoln, was the Morrill or Land Grant College Act, which enabled the federal government to give land to a state for the purpose of paying for a state agricultural college. The second was the measure which created a federal bureau of agriculture to find ways to promote methods of increasing agricultural production. The third was the Homestead Act, most far-reaching of all. This act stated that any American citizen could have 160 acres of government land free if he would live on it for five years. At last, under a western President, the West got what it had long demanded, free land.

There were many reasons for this new land policy. The East was not receiving the revenue it had expected from the sale of western lands. The West had been in constant turmoil over speculators, squatter's rights, high prices. The South, now out of the union, was no longer able to demand large land grants suitable for cotton plantations. Added to these regional problems was the fact that new land was needed to supply food for the Union armies. Thus, by the time the war ended, three years later, more than 14,600 homestead entries had been made in Wisconsin, Minnesota, Iowa, Kansas, and Nebraska.<sup>34</sup>

With the passage of the Homestead Act came another change in government policy. This was the giving of huge areas of land to the transcontinental railroads to help pay the cost of building them. Actually, this policy had begun earlier, but it was not until the building of the great transcontinental lines that it got under way in earnest. The total area given by the federal government was equal to more than the area of New England, while the states added enough to make the total more than the area of Texas. This land was to be sold to settlers by the railroads at not more than \$2.50 an acre.

With the giving away of so much public land, the govern-

<sup>34</sup> McMaster, *History of the People of the United States during Lincoln's Administration*, D. Appleton-Century Company, New York and London, 1927, p. 560.

ment decided that some rules would have to be made for land on which there were some especially valuable natural resources. For this reason the Timber and Stone Act was passed. This law provided for the sale to any one person of 160 acres of land from which the timber and stone could be taken for personal use, at a minimum of \$2.50 an acre.<sup>35</sup> Based on the same idea of charging a premium for special lands, laws were passed to sell coal lands, petroleum lands, phosphate lands, and water-power sites at higher prices than other land. In most cases it became necessary to repeal or amend these acts. Unfortunately, they were not repealed until after many millions of acres had been drained of their riches by dishonest or greedy land grabbers.

#### THE LIFE OF THE PIONEER

What happened to the people who settled on this government land? In his *New Guide for Emigrants to the West* written in 1837, Mr. J. M. Peck describes the living conditions of the early settlers thus:

“Many persons, on moving into the *back woods*, who have been accustomed to the decencies of life, think it little matter how they live, because *no one sees them*. Thus we have known a family of some opulence to reside for years in a cabin unfit for the abode of any human being, because they could not find time to build a house! and whenever it rained hard, the females were necessarily engaged in rolling the beds from one corner of the room to another, in order to save them from the water that poured in through the roof.”<sup>36</sup>

The men wore hunting shirts, “a kind of loose, open frock, reaching half way down the thighs, with large sleeves, the body open in front, lapped over and belted with a leathern girdle, held together by a buckle. The cape is large, and usually

<sup>35</sup> Hibbard, *op. cit.*, p. 465.

<sup>36</sup> p. 99.

fringed with different colored cloth from that of the body. The bosom of this dress sometimes serves as a wallet for a 'chunk' of bread, jerk or smoke-dried venison, and other articles. It is made either of dressed deerskins, linsey, coarse linen, or cotton. The shirt, waistcoat and pantaloons are of similar articles, and of the customary form. Wrappers, of cloth or dressed skins, called 'leggings,' are tied round the legs when traveling. Moccasins, of deer skins, shoe-packs and rough shoes, the leather tanned and cobbled by the owner, are worn on the feet.

"The females dress in a coarse gown, of cotton, a bonnet of the same stuff, and denominated in the Eastern States a 'sun bonnet.' The latter is constantly worn through the day, especially when company is present. The clothing, for both sexes, is made at home."<sup>37</sup>

"The necessary table and kitchen furniture are a few pewter dishes and spoons, knives and forks (for which, however, the common hunting-knife is often a substitute), tin cups, for coffee or milk, a water-pail, and a small gourd or calabash for water, with a pot, and iron Dutch oven, constitute the chief articles."<sup>38</sup>

As you might expect, the death rate among people living under these conditions was very high. One man wrote, "I solemnized the marriage of a young lady of my acquaintance, who was under the age of fourteen years. In eight days she was a widow. At the funeral of a gentleman, the same season, who left a widow under twenty years, there were present thirteen widows, all under twenty-four years of age, and all had lost their companions that season."<sup>39</sup>

But in spite of these and many other difficulties, the people flocked to the West. Editors like Horace Greeley hammered

<sup>37</sup> *Ibid.*, p. 122.

<sup>38</sup> *Ibid.*, p. 126.

<sup>39</sup> *Ibid.*, p. 89.

home the slogan, "Vote yourself a farm."<sup>40</sup> Railroads with government land to dispose of sent out propaganda, dispatched agents to the East and to Europe to spread the news of cheap, fertile land that a man could get for his own at almost no cost. The federal government, through the Land Office in the Department of the Interior, and state governments held out the bait of free land to all men whose courage was as great as their land hunger.

And so they came by the thousands, from Germany, from Ireland, from Scandinavia, from the eastern seaboard of the United States. They were farm tenants who saw a chance for independence, they were farmers who had exhausted their soil in the East. They were clerks, and small merchants, and factory workers who wanted to escape from the growing cities.

#### THE GROWTH OF THE "FARM PROBLEM"

But as the farming areas of the Middle West filled with hopeful farmers, many of them found that they had not really escaped from their troubles. In some cases it was a matter of exchanging old troubles for new ones equally difficult. The settlers had assumed that once they had a piece of soil they could call their own, they would grow rich merely by producing grain and meat. True, once the steel plow had been invented to turn over the thick, black prairie sod, they got undreamed of crop yields. The growing cities of the East and a large foreign market for American grain absorbed these products of the West. The chief basis for the foreign market was the repeal of the Corn Laws in England in 1846. These laws had levied a duty on grain shipped into England. When they were repealed, American grain became England's cheapest source of supply.

But having a market was not enough to bring prosperity to the new farmers. With the Civil War had come the invention

<sup>40</sup> Parrington, *op. cit.*, p. 128.

of farm machinery to increase the production of crops. This meant that an individual farmer could produce more, but it also meant that he needed more money with which to buy expensive machinery.

The gang plow and the combine, for instance, enabled farmers to cultivate more land. This meant there had to be a much greater market for farm products to consume the larger crops and to give the farmer the money with which to pay for the machinery. Machinery turned the farmer into a business man who had to have an outlet for his goods and capital to pay for his equipment. So long as there was a large foreign market to absorb the grain, cotton, and beef produced by these commercial farmers, all was well. But when Russia and other countries also turned their vast plains into wheat fields, the foreign market was over-crowded. This meant that the American producer could not make a profit.

Then there was the problem of transportation. Railroad rates were high, and the charges of the railroad companies to store grain in elevators were higher. When the farmers tried to build their own elevators, the railroads either refused to haul grain to them, or charged such high freight rates that it was impossible to ship to them. A man who wanted to ship goods from Gilman, Illinois, to New York discovered that the freight charge was \$65. To ship the same amount of goods from Peoria, 86 miles farther west, cost but \$39. The reason for this was that the railroad had a competitor at Peoria, hence the lower rate. At Gilman the railroad had the field to itself, and charged accordingly.

In 1874 Minnesota, Iowa, and Wisconsin, three of the new farm states, passed laws regulating railroad rates and methods. The Supreme Court approved of these so-called "Granger laws" in 1876, but ten years later it changed its opinion and declared in effect that the states had no right to regulate railroads.



In the 1870's the troubles of the western farmers had become so acute that they had organized political parties, first the Grangers, and later the Populists. These parties wanted to regulate the sale of land and the costs of transportation, and provide a way to borrow money at low rates of interest. The parties failed as parties. Nevertheless, their attacks on unfair railroad rates set in motion the forces which finally pushed through Congress the Interstate Commerce Act to regulate railroads.

The World War opened a great new foreign market for American agricultural products. The allies, with all their men in the trenches, had few at home to grow food. In their stead, the American farmer supplied the grain and the meat that fed the armies and civilians behind the lines. These farmers were, for the most part, descendants of those who had settled in the Middle West a half century before.

The prices of land skyrocketed; machinery, now even more necessary, cost huge sums. The farmers borrowed money at high rates of interest to buy this land and machinery. Taxes mounted to pay the increasing costs of government. Farmers' money was invested in huge land drainage and irrigation projects.

Just when this load of debts was heaviest, the market crashed again. The war ended, and the soldiers who were left went back to their fields in Hungary, Germany, Rumania, France. All Europe owed the United States billions of dollars, and our high tariff kept European manufactured products out of this country. This meant that foreign nations could not sell their products here, and thus earn money to pay their debts and buy American farm products. It also meant that they had to reply to our high tariff policy with a tariff on what they bought from America, mostly farm products.

The price for which the farmer sold his goods sank. The costs of government, labor, and machinery and the many things

he had to buy stayed up and went higher. American farmers had 50,000,000 acres planted with crops for export and the export market was disappearing like a snake swallowing its tail. Thus the farm problem became a major national problem.

A farmer's wife in one of Hamlin Garland's stories put the farm problem in a nutshell when she said, "I d'know. Seems as if things get worse an' worse. Corn an' wheat gittin' cheaper 'n cheaper. Machinery eatin' up profits—got to *have* machinery to harvest the cheap grain, an' then the machinery eats up profits. Taxes goin' up. Devil to pay all around; I d'know what in thunder is the matter."<sup>41</sup>

This is how some historians have tried to explain the problem. Before the World War the United States was a debtor nation. This meant that the United States had to borrow money from foreign nations to pay for its railroads, factories, and other developments. To repay these debts the United States sold farm produce to the foreign countries. By the time of the World War the United States no longer needed foreign money. Instead it needed a market for the goods produced by the factories that were built with foreign money. Factory products took the place of farm products as America's chief goods for sale to the world. This is a very important point.

Since the beginning of American history there has been a conflict between the two main groups of American people. On the one side are the city people, the storekeepers, the factory owners, and the industrial workers. On the other side are the country people, those who work with the land. Up until the Civil War the people who worked with the land had the upper hand in our government. Since that time, those who work with machines and money have become the most powerful group in our society. Leadership passed from the farmer to the manufacturer and merchant.

<sup>41</sup> *Other Main Travelled Roads*, Harper & Brothers, New York, 1892, pp. 99-100.

## FARM VS. FACTORY

America had an abundance of two kinds of natural resources. It had millions of acres of fertile land to produce crops. It also had stored away in the land great deposits of iron and coal and oil and the other raw materials that are needed for factories. The men who owned the ore pits and coal mines grew rich and powerful much faster than the men who owned the farms. Factories grew up around the mines and along the rivers which supplied water power for factories. Cities sprang up beside the factories and at the centers of transportation where the products of both the factories and farms were traded and shipped.

In 1880 agricultural products made up 83.3 per cent of the value of exports from the country and manufactured goods and minerals made up 13.2 per cent<sup>42</sup>; in 1936 the percentage of agricultural exports had dropped to 29.36 per cent and nonagricultural exports had gone up to 70.64 per cent.<sup>43</sup> In addition to this, the factory owner had then as now a great advantage over the farmer. The farmer sows his fields, harvests his crops, and sells them for what he can get. The price is determined by the supply, which depends chiefly on the weather, and the demand, which depends on the amount of farm crops available all over the world. In other words, the farmer grows as much as he is able to, and takes the best price he can get. As an individual he has no control whatsoever over either supply or price. The factory owners, on the other hand, have frequently been able to control the supply by cutting down on production. This is especially true since large corporations have taken the place of small individually owned factories. With the help of the tariff the corporations can get a price for their

<sup>42</sup> Hacker and Kendrick, *op. cit.*, p. 217.

<sup>43</sup> *The World Almanac*, 1938.

products which will enable them to make a profit. Supply and price are both regulated to a great extent by the manufacturer.

These facts explain a very strange thing which occurred after the World War. As we have seen, the value of farm products sank. But the cost of the machinery and other goods which the farmer needed soared. There was an industrial boom. Factories worked over-time. The more the factories made, the more money the bankers lent to the manufacturers to build more factories to make more goods.

However, factories must have a market for their products, and one of the biggest markets for manufactured goods is the American farmer. Burdened with debts, high costs, and taxes, he couldn't buy. And when in October, 1929, the factories suddenly found that they had run out of orders, the farmers said, "Maybe now the city people will get the point of what we have been saying for years." By 1932 no one could mistake that point. Industrial activity of the country had dropped 47 per cent below normal. The farmers, who had been going through a long period of decline, found that their income had shrunk 57 per cent in the three years since 1929.<sup>43a</sup>

#### THE FARMERS STRIKE

The collapse of industry meant that the farmer was now losing his domestic as well as his foreign market. Like the Massachusetts farmers of Revolutionary days under Captain Daniel Shays, farmers in Iowa, North and South Dakota, Oklahoma, Kansas, Oregon, Washington, Colorado, Wisconsin, North Carolina, Michigan, Ohio, New York, Tennessee, Nebraska, Arkansas, Pennsylvania, Utah, Minnesota, Illinois, in practically every agricultural section in the country, banded themselves together to protect their interests by force, if necessary. Many times the farmers adopted a device developed by factory workers. They struck. The purpose of these strikes

<sup>43a</sup> Faulkner, *op. cit.*, p. 759.

was to prevent cheap farm produce from reaching the markets and forcing farm prices down further. Farmers formed unions such as the Farmers Union, which said, "The American farmer cannot be expected to much longer endure the hardships placed on his shoulders by conditions for which he is not responsible."<sup>44</sup>

And just as the militia was called out to put down the farm revolt of Daniel Shays, so it was called out to put down the revolting farmers of the 1930's. There were farm pickets and farm strike-breakers. A report like this might have come from an industrial city like Detroit. Actually it came from the farming community of Cherokee, Iowa. "Fourteen men were wounded when a carload of armed strike-breakers fired into the picket lines near Cherokee."<sup>45</sup>

These farm strikes can be divided into two classes. First, there were the strikes to prevent prices of farm products from falling further. Most of these strikes were concentrated in the milk-producing areas. The second type of strike was to prevent mortgageholders from taking over the land of those farmers to whom they had lent money. In many cases these lenders were large insurance companies and banks.

In 1933 the total value of land held by such corporations was estimated to be \$770,000,000. Most of this money was invested in farms which had been taken over because the original owners could not pay the interest and principal of the mortgages held by the corporations. This was more than 2 per cent of the value and about 2.6 per cent of the area of all the agricultural land in the United States. At first the sheriffs and law officers who were to take over the farms for the mortgageholders stood back and permitted the farmers to stop the foreclosure sales. But as the depression wore on, the law officers began to feel

<sup>44</sup> Mauritz A. Hallgren, *Seeds of Revolt*, Alfred A. Knopf, Inc., New York, 1933, p. 149.

<sup>45</sup> *Ibid.*, p. 151.

**Burleigh County****FARMERS - WORKERS  
Mass - Meeting****CITY AUDITORIUM****Bismarck, Saturday, August 1st., 1:00 P.M.**

Our economic struggle has become unbearable, due to the condition of drought. Starvation of humans as well as animals is facing us all. Something must be done immediately to save mankind and beasts from real suffering.

This Burleigh County Mass Meeting has been called by The Burleigh County Holiday Association, supported by The American Federation of Labor, The North Dakota Labor Association, Inc., The State Unification Committee of WPA Workers, The Workers Labor Club of Bismarck.

This distress and condition for food is the people's question, and must be discussed by the people. For this purpose this mass meeting has been called. This is your meeting, you are expected to be present with all your friends and neighbors.

**TOPICS TO BE DISCUSSED**

1. The immediate relief of food for man and beast.
2. An American living wage scale for all workers on projects.
3. Pension for all old age people.
4. Winter consideration, such as coal, shelter, clothing, food for humans as well as animals.
5. How can such mass meetings spread into every county of this state, and into every state of this nation?
6. Unification of all Farm Organizations and Labor Organizations, upon the question of The Right to Live, food, clothing, and shelter.
7. Any other, non-political, question which concerns the farmer and the worker at this time.

Burleigh County Holiday Association, Fred Argast, President  
 American Federation of Labor, Adam Voight, Chairman Bismarck Central Labor Body  
 Burleigh County Labor Association, Frank Walker, President  
 Workers Labor Club of Bismarck, Gene Hunt, President


CAPITOL PUBLISHING CO., BISMARCK, N. D.

*Courtesy of the Farm Security Administration*

Farmers did not take the hard-times of the early 1930's lying down. As farm markets vanished and farm mortgage sales became daily more numerous, posters like this began to appear all over the Middle West.

that these farm riots had passed the joking stage. By 1933<sup>46</sup> police were firing upon farmers who were trying to prevent a sale in Pennsylvania. Finally in Iowa the militia was called out to scatter farmers who were trying to prevent the sale of a neighbor's land.

Thus American agriculture completed a cycle. This cycle began with the Revolution, when the farmers revolted partly to win new land and establish an agricultural nation. It ended in modern times when the farmers again revolted in an attempt to hold a place in the industrial society which had grown up in the nation they had helped to establish. Many experts believe that the farmers have lost this second battle. They think that American agriculture can continue only if it is aided by funds from the government. They point out that such aid is simply a kind of tariff. The tariff acts, they add, are nothing more than a gift of high prices from the government to industry.

What has this struggle done to the American farmer and his land? It was a long battle beginning back in the middle of the last century. Like most long wars it has left deep scars.

#### THE PROBLEM OF THE LAND

First consider the land. Land is the basic resource. Without productive land a nation either dies or becomes dependent upon other nations for its essential foods. The vast majority of farmers who came to America during the early days of its history thought of this country as a place in which there was an inexhaustible supply of land. Since there was always more land to be had, they saw no point in working to preserve the fertility of the soil. Thus much of the rich land of the eastern seaboard was exhausted long before agriculture was really challenged by industry. There were a few scientific farmers like Washington and Jefferson who preached crop rotation, strip

<sup>46</sup> Associated Press, March 30, 1933.

cropping, contour plowing, and many of the other soil-saving devices we hear so much of today. But they were unheeded.

Then came the first land boom. Millions of acres of land were cleared in a few years. And some of these millions of acres, advertised as true Gardens of Eden by the speculators who held them, should never have been farmed at all. The climate and other natural characteristics of this land were not understood by the immigrants. As a result they upset the delicate balance which nature maintains. In a generation, this poorer land was added to the growing total of abandoned land in the East.

Three inventions opened the Great Plains to the land-hungry immigrants. The first was the barbed wire fence, which provided a cheap way to keep out roving live stock. The second was the steel plow, the first plow that could turn over the prairie sod. The third, Colt's revolver, gave the plainsmen a weapon with which they could drive out the hard-riding Plains Indian. With these three tools agricultural America began to grow.

But as agricultural America began to fill out the continent, industrial America began to blacken the skies of the East with the smoke from its factory chimneys. And where the strength of the farmer was in his numbers, the strength of the manufacturer was in his money. In the end money was the stronger. The farmers suffered their first real defeats after the Civil War when the South, politically the strongest agricultural section of the country, was left powerless by its surrender. The Middle West became the stronghold of the farmer. Unlike the South, which had made the Democratic party its political weapon, the West was unable to create a strong party to carry into action its political beliefs.

The World War boom in agriculture gave the farmers a false hope. The direct result of this hope was that tilled land in the United States jumped from 1,640,625 square miles in



1909 to 1,756,250 square miles in 1919.<sup>47</sup> Most of this new land was in the West and Middle West. Of course when prices are high, even poor land will support a family. But when prices are low, good land plus a knowledge of sound farming practices are necessary if the farmer is to make a profit. A large part of this new land was poor. When prices sank, the farmer could not grow enough to keep his family. So once again great areas of land were abandoned. From 1917 to 1929 the acreage of tilled land shrank by about 4,700 square miles, the first decrease in the history of the country, according to the ten-year census.<sup>48</sup>

When land is abandoned, two things may happen. The old fields may grow up in brush and all that will be left to mark the farm will be a few old stone walls and a lilac bush beside the cellar hole of the house. This is usually the case in the East. In the West, however, where there is less rain to nourish the growth of grasses and brush, the tilled land often does not heal. It becomes a sore. It spreads. The topsoil washes away. Perhaps wind blows the soil from the abandoned fields to an adjoining grass field, killing the grass. Then that field, too, becomes a bare flat to add its dust to the next field, and so on. In both the East and the West, gullies cut into old abandoned fields. These gullies, once they get started, are no respecters of property lines. Forty years ago a drip from a farmer's barn in Stewart County, Georgia, started a gully which today has consumed more than 40,000 acres.<sup>49</sup> Bad land spreads like an infectious rash over the countryside.

#### TENANCY AND POOR LAND USE

The fate of the people who tilled this land was not much happier than that of the land itself. They too were eroded and

<sup>47</sup> National Resources Board Report, *op. cit.*, p. 110.

<sup>48</sup> *Loc. cit.*

<sup>49</sup> Stuart Chase, *Rich Land, Poor Land*, McGraw-Hill Book Company, New York, 1936, pp. 93-96.

leached and washed away. Tenancy is frequently the result of destroying the fertility of the land. When the land will not produce enough to provide a living, the farmer loses his farm. Usually, if he doesn't drift to the city to look for a job, he goes to work for another farmer as a tenant. Tenancy today is most widely spread in the South, where there are 1,831,000 farm tenants.<sup>50</sup> In Iowa, the foremost agricultural state in the Union, 49.6 per cent of the farmers are now tenants.<sup>51</sup> Approximately half of the \$770,000,000 which corporations have invested in land mortgages is concentrated in the West North Central States. And a few generations ago this was the promised land to which people flocked to carve out farms of their own.<sup>52</sup>

In 1930, 431,587,424 acres of farm land were leased by tenants. This means that 43.7 per cent of all the farm acreage in the United States was farmed by tenants.<sup>53</sup> To put it another way, 52.8 per cent of all the farmers in the United States leased some land to farm in 1930. At the same time, 42.4 per cent of all the farmers leased all the land they farmed.

The early principle of American agriculture was that a man could have land of his own. From the beginning of American history, however, there has been a problem of tenancy in the settled regions. In 1678 the people of Deerfield, Massachusetts, were complaining, "You may be pleased to know that the very principle & best of the land; the best for soile; the best for situation; as lying in y<sup>e</sup> centre & midle of the town: & as to quantity, nere half, belongs unto eight or 9 proprietors each and every of which, are never like to come to a settlement amongst us, which we have formerly found grievous & doe Judge for the future will be found intollerable if not altered."<sup>54</sup>

<sup>50</sup> *Farm Tenancy*, Report of the President's Committee, United States Government Printing Office, Washington, February, 1937, p. 35.

<sup>51</sup> *Ibid.*, p. 96.

<sup>52</sup> National Resources Board Report, *op. cit.*, p. 192.

<sup>53</sup> *Ibid.*, p. 191.

<sup>54</sup> Faulkner, *op. cit.*, pp. 136-137.

The tenants of Deerfield moved on to new land when they became completely disgusted with being tenants. Today there is little new land to move to. Farmers who lose their land become and usually remain tenant farmers. A tenant farmer does not have a permanent home. In many cases, particularly among the southern sharecroppers, he must be constantly moving, without ever getting really settled.

When a factory worker moves to a new job or a storekeeper opens a store in a new town, it may not be long before he is well established. With a farmer, it is different. It takes years to understand a piece of ground, how it should be plowed, what will grow best, what fertilizers it needs. A farmer who is constantly on the move has little chance to get the best out of the soil he works. Both the 1925 and the 1930 agricultural censuses showed that less than one-half of the tenant farmers had occupied their places two full years or more.<sup>55</sup>

The share-cropper of the cotton growing South has become a classic example of the American farm tenant. There are many of these people who rarely live on the same land for more than a year. They are given a share of the value of the cotton they produce to pay the costs of their food and lodging while they work in the fields, hence the name, "share-cropper." It is not unusual for the cropper to end a year of work without having earned enough to pay his employer for the food he has had to buy. Here is what one traveler saw when he went through the share-cropper region:

"We went some miles south and turned off the road toward some tumbledown shacks. The shacks were little more than decayed boards roughly nailed to uprights, with gaps between them covered on the inside with newspapers. You would have kept your pigs in them if you didn't care much for the pigs. They were set in little clearings and were very picturesque at

<sup>55</sup> *Yearbook of Agriculture*, 1936, United States Department of Agriculture, United States Government Printing Office, Washington, 1936, p. 53.

any range above fifty yards. One was leaning over at an angle of twenty degrees from the vertical and was kept from falling over by two thick timber-props."<sup>56</sup>

Even though they live on farms, the sharecroppers rarely grow vegetables or keep a cow or chickens. Frequently cotton must be planted right up to the doorsteps of their shacks. Every inch of land must be used for the cash crop. The result of this is that they must live on a diet so poor that a really healthy sharecropper is rare. The usual food consists of what the croppers call "3M," meat, meal, and molasses. Only rarely is the meat other than salt pork.

On the one hand, many of the planters claim that the croppers are unfit for a better existence. They say that the average cropper is shiftless, ignorant, and unable to take the responsibility of owning land. On the other side, the sharecroppers and their spokesmen say that many of the planters, who depend on their labor, cheat them out of their earnings, take away their civil liberties, and stand in the way to block any of the education and organization which might make it possible for them to become secure land-owning farmers.

If tenant farming is bad for the farmer, it is worse for the land. A tenant farmer must get everything he can out of the soil to pay his living and make a profit for the owner. He usually cannot afford to spend time and money to make the soil permanently fertile. He must take what he can get. After all, he reasons, it is not his land. His job is to create money every year, not a fertile farm which would be a permanent home for a family for generations. And since the tenant farmer cannot be primarily interested in building up the soil, it is frequently on tenant farms that the greatest soil erosion and exhaustion are found.

The owners of tenant farms are also too frequently indifferent to the fate of the land. They may be retired farmers or

<sup>56</sup> *Dixie Detour* by Cedric Belfrage, *Harper's Magazine*, Sept., 1937, p. 377.

land speculators, or banks, or insurance companies. At any rate, they are mostly absentee owners who cannot give personal supervision to their farms, and who often have little interest in the welfare of the soil. The combination of absentee ownership and tenancy is a powerful ally of soil destruction; it is a powerful ally also of poverty and discontent.

There is one bright spot in this otherwise dark picture of farm tenancy and absentee ownership in the United States. About one fifth of all farmers who are tenants lease their land from relatives. This means that they have an interest in maintaining the fertility of the soil. Therefore, "relative" tenants are likely to be in a more secure and prosperous condition than other types of tenants.

Not all farmers who have for one reason or another failed to succeed have become tenants. Many of them have held on to their land, trying to scratch some sort of living from it. And every year, because they could not afford fertilizer or other soil-saving practices, the land has become poorer. Much good land has been ruined by carelessness, ignorance, or greed. This land, as its production sinks below a point where it will support a family decently, is called submarginal land. The chief effect of sub-marginal land is that it makes sub-marginal people, that is, people who barely manage to keep body and soul together.

#### ONE-CROP FARMING AND THE SOIL

One of the underlying causes of the rapid growth of submarginal land in the United States is the one-crop system. This system encouraged the mining of soil to get cash to pay for machinery, taxes, and higher land values. The one-crop system is the basis of "commercial agriculture." In very simple terms, it works something like this. In the South, the chief one-crop area, this system of agriculture has been going on for generations. Cotton is a crop that earns a cash income. As cotton

brought lower prices on the market, it was necessary to grow more cotton to pay for the expenses of raising it. And the more cotton that was grown, the lower the price dropped. And the more the soil was bled by over-cropping, the more it cost for fertilizers to restore enough fertility to grow a profitable amount of cotton. The sharecropper is one of the worst fruits of this method of tillage.

In the corn and wheat belts somewhat the same thing has happened. Because corn and wheat, and the livestock fed on corn and wheat, could be sold for the cash that was so necessary to pay the mounting costs of machinery, taxes, and land, and because they did not realize the destructive effects of one-crop farming, the farmers turned most of their fields into corn and wheat fields. They abandoned the old idea of agriculture, which was that the farmer should be self-subsistent; that is, that he should grow what he needed for himself and thus have little need for cash. But as agriculture came into sharper conflict with industry, the farmer had to adopt the methods of industry, which are to accumulate money. And the only way to accumulate money was to grow crops that could be sold, even at the cost of finally exhausting the land.

One extreme of commercial agriculture is a farm like the Campbell wheat farm in Montana, where 50,000 acres were planted in wheat. To grow this wheat \$2,000,000 had to be invested in machinery.<sup>57</sup>

Another important cause of sub-marginal land has been the rapid depletion of the forests east of the Great Plains, especially those of the Northeast, the Lake states, and the Appalachians. Much rich land covered with the original virgin forests had, of course, to be cleared to make way for farms and settlements. But the remaining farm woodlands and the big commercial timber tracts on the poorer soils and the steeper slopes

<sup>57</sup> "The Grass Lands," *The Broken Sod*, Section II, *Fortune*, November, 1935, p. 187.

have been so badly depleted by over-cutting and fire that thousands of rural wood-using industries have gone out of existence. These industries and the big logging operations that fed them gave many farmers opportunities for winter wage work, for the hire of their teams, and a market for hay, grain, and food.

Forests managed for permanent production give rural wage work not only to harvest mature timber, but to maintain roads, protect the woods from fire, and to improve the growing timber by weeding and thinning. One small federal forest in northern Michigan, for example, is able to guarantee \$500 a year wage work to each of twenty-eight sub-marginal farm families in the neighborhood.

The farms of the United States contain 185,474,965<sup>58</sup> acres of timberland, and interspersed with them are many millions of acres of commercial timberlands—all, with few exceptions, producing only a fraction of the timber they could produce with good management. The misuse of this vast resource has unquestionably greatly reduced total farm income and has had particularly bad effects on hill farms where timber production is an essential part of farm income.

When the same crop is planted in the same soil for a long enough period of time, the soil is exhausted. Crops must be rotated to rest the soil and restore plant nourishment. There must be cover crops to hold the soil, and green manure crops to enrich it. There must be terracing or strip cropping, or other erosion control devices. In other words, the farm must be treated as a biological unit instead of a plant factory. All of this takes effort, skill, knowledge, and sometimes a reduction or postponement of income. But the commercial farmer who depends solely on his cash crop not only to pay the costs of raising his crop, but even to buy food and the necessities of life, can hardly afford to rotate crops when prices are low.

<sup>58</sup> Letter from United States Forest Service, 1939.

Thus a vicious circle begins. The more wheat he must grow, the less he can grow, as the soil becomes less and less fertile.

Many of the larger commercial farms survive because they can afford to go through several bad years without mining the fertility of the soil. But the smaller commercial farmer usually cannot coast along until prices rise. His only hope is to be able to plant enough wheat, or corn, or cotton to pay his living costs, regardless of the price for which he can sell them. He does mine the fertility of his soil. And when that fertility is gone, his farm sinks to the level of sub-marginal land. Anyone who has seen the tar-paper shack of the sub-marginal farmer of the Northwest, the tumbledown cabin of the southern share-cropper, and the acres of desert which the dry farmer has left behind him knows that it is the farmer who loses.

## SECTION II

### GOVERNMENT POLICIES ON LAND USE

Thus far we have written about what happened to the American farmer and his land. The next point is, why did it happen? Why did the history of American agriculture follow one pattern rather than another?

There were two major forces which shaped the pattern of our farm land use. The first was the attitude of the people who used the land. They thought of it as an inexhaustible resource. It never occurred to them that there would ever be a time when there would not be enough good land to go around.

Coupled with this belief in the unlimited amount of good soil was a passion to own land. The people who settled the United States believed that liberty could be had by owning land. To them it was a source of both freedom and of food. This faith in the ownership of land has continued to the present day. Unfortunately, it is little more than a belief for the 42 per cent of the farmers who now must live on farms that they rent.



The other force that controlled the direction of American agriculture was government. Government reflects the will of the people. In a democracy it reflects the will of the majority of the people. When the voting power lay with the merchants and large landholders of the eastern seaboard, the government was interested chiefly in selling federal land to raise revenue which would help meet the cost of government. But as the South and its ally, the West, developed and finally came into power under Andrew Jackson, the idea that land should be sold for revenue gave way to the idea that land should be made as cheap as possible. This was the farmer's way of developing government land. The main difficulty was to keep the speculators from grabbing most of it.

By the time of the Civil War, a new and more powerful voice began to shout the farmers down in Congress. This voice came from the banker, the manufacturer, the merchant, and the factory worker. They called for and got the era of high tariff which raised the cost of what the farmer bought, but did not greatly increase the price of what he sold.

A good idea of the course of the conflict between the farmer and industry in government can be gotten by tracing the federal land policy. A clearer idea of this same conflict can be obtained by tracing the course of the federal money policy. The farmers wanted cheap money. They wanted a mild form of inflation, that is, more money in circulation. The farmers believed that if there were more money in circulation, they would have more money with which to pay their debts. They also wanted laws to make it easier for them to borrow money.

At the presidential nominating convention of the Democratic party in 1896, William Jennings Bryan stated the farmer's money creed. "You come to us and tell us that the great cities are in favor of the gold standard. We reply that the great cities rest upon our broad and fertile prairies. Burn down

your cities and leave our farms, and your cities will spring up again as if by magic; but destroy our farms, and the grass will grow in the streets of every city in the country."<sup>59</sup> The money policies of the farmer were expressed in the tickets of the Greenbacker party, the Populist party, the Free Silver Democrats of Bryan's time and the Progressive party of Robert La Follette, Senior. All of these proposals were defeated.

#### FARMERS AND TAXES

Although few people may realize it, one of the most powerful government influences on farm land is taxation. The principle of agricultural taxes up until the 1930's was to tax the land according to the value of the crops it produced. The only exceptions to this were in the earlier period of American history when the government was anxious to have the vast public domain settled. At that time when a period of years was given to a settler to pay for his land, the government did not levy any taxes on the settler until the land was paid for. That was an example of government using its taxing power to aid land settlement.

With the exception of the tariff acts, which were a kind of taxation to aid industry, the government had rarely used this taxing power for any other purpose than to raise revenue until 1933, when the federal government changed its approach to the problems of the land. This change is a shift from a policy of promoting land development to a policy of land control. The government has used the taxing power as a tool to enforce this control. The first Agricultural Adjustment Act, passed in 1933, is an example of this use of the taxing power. According to this act, the government taxed processors of agricultural products to help raise money to pay for crop control and good land use.

<sup>59</sup> Hacker and Kendrick, *op. cit.*, p. 313.

## FARMERS AND CROP CONTROL

To find a market for surplus agricultural products, several schemes were proposed. The best known of these was the McNary-Haugen Bill, which was finally vetoed twice by President Coolidge, once in 1927 and again in 1928. The essential purpose of this bill was to fix the domestic price at a high figure which would yield enough profit so that the farmers could afford to sell the surplus abroad at the lower prices foreign countries were willing to pay.<sup>60</sup>

When President Hoover came into office, the country was still going through an industrial boom. But the farm problem grew worse. Mr. Hoover's solution of the farm problem was the Agricultural Marketing Act of 1929. This act rejected the idea of price-fixing and subsidies to farmers,<sup>61</sup> for the idea of limiting surpluses. This idea of limiting surpluses was later to become the keystone of a more drastic agricultural law. The important thing about Mr. Hoover's method of limiting surpluses was that they were to be reduced by a voluntary agreement among the farmers. Another feature of the act was the stabilizing corporations. These were agencies set up by the government to buy agricultural surpluses with government money and either sell these surpluses abroad or keep them in storage until the price reached the high figure originally paid for the produce. Thus the Grain Stabilization Corporation bought 330,000,000 bushels of wheat at 20 to 30 cents a bushel more than it would bring on the world market.<sup>62</sup> As soon as the Grain Stabilization Corporation stopped buying grain, however, the domestic price fell to 57 cents a bushel, the lowest price since 1896.<sup>63</sup> The Corporation was left with a huge wheat surplus on its hands and no way to get rid of it, and the

<sup>60</sup> *Ibid.*, pp. 645-646.

<sup>61</sup> *Ibid.*, p. 648.

<sup>62</sup> *Ibid.*, p. 649.

<sup>63</sup> *Loc. cit.*

price of wheat continued to fall. One reason for this was the fact that, since the limitation of surpluses was purely voluntary, the high prices brought about by the Corporation only encouraged the farmers to sow more grain. In 1931-32 there were 14,000,000 bushels more of wheat produced than there were in 1930-31. The other Stabilization Corporation of the Farm Board dealing in cotton had the same troubles.

After two years of operation the books of the Farm Board showed a loss of \$185,000,000, which was 50 per cent of the money originally given to it by the federal government. The cotton it had bought for 16 cents a pound was selling for 6¾ cents a pound; wheat which it had bought at \$1.18 and later at 82 cents a bushel was selling at 61 cents a bushel. And it had to pay \$7.20 a bale storage costs a year for keeping the surplus cotton it had bought. The storage of wheat was costing 18 cents per bushel a year.<sup>64</sup>

#### AGRICULTURAL ADJUSTMENTS

When Mr. Roosevelt was elected President in 1932, the farmers in many parts of the country were in open revolt. On March 16, 1933, less than two weeks after he was inaugurated, Mr. Roosevelt presented to Congress his plan for farm relief. This was the Agricultural Adjustment Act. In explaining his recovery policies, Mr. Roosevelt said, "What we seek is balance in our economic system—balance between agriculture and industry and balance between the wage earner, the employer, and the consumer."<sup>65</sup> For the farmer this meant a balance between what he received for his crops and what he paid for the things he bought. The Agricultural Adjustment Act was designed to raise the price of farm products so that the farmer would have more purchasing power.

When you pare the Agricultural Adjustment Act, and the

<sup>64</sup> *Ibid.*, p. 650.

<sup>65</sup> *Ibid.*, p. 742.

other agricultural acts which followed it, down to the basic idea, you come to this fact. The attempts of government to control the use of farm land were all designed to establish a balance. In the first chapter of this book we discussed the balance of nature. The new farm acts were an attempt to balance agriculture so that it would fit in not only with the economic balance but with the balance of nature as well.

When you understand that, you will have a clear idea of just what is going on in the minds of those people who are struggling with the problems of land use today.

#### EXPANDING LAND USE

This is an important shift in point of view about land use. That shift can be expressed in this way. For generations the key word in land use was expansion. From the point of view of the farmer, expansion meant cultivating more land, growing larger crops. To help this expansion the Department of Agriculture has developed many bureaus. For instance, there are the Bureaus of Plant Industry and Animal Industry, which develop new types of plants and study profitable methods of raising livestock. The Bureau of Agricultural Chemistry and Engineering devises machinery and methods of farming best suited to particular soil types. The Bureau of Entomology and Plant Quarantine concentrates on diseases of plants and animals, and administers the laws which restrict the shipment of certain plants and animals because of the diseases they may carry.

In addition to these there are the many activities of the Department in the states. The Extension Service, for instance, has 9,277 extension workers in the various states and territories of the United States to help the farmers grow more and better crops.<sup>66</sup> State agricultural experiment stations coop-

<sup>66</sup> Chart: *Number of Extension Workers*, United States Department of Agriculture, Extension Service, Division of Coöperative Extension, June, 1938.

erate with the state land grant colleges in trying to increase crop production.

As late as 1928 Chambers of Commerce were trying to draw settlers into new lands. It didn't seem to matter to them very much that this land would not grow crops. For generations people had been able to think of the land in terms of size. It was to their minds simply a matter of more crops, more land; in other words, expansion.

#### BALANCED LAND USE

The basic idea of balance is something quite different. Instead of more crops, more land, balance aims at more stability. The idea behind a balanced land use is a continuous, profitable use of the land by those who live on it.

To have balanced land use, these four elements must be so regulated that no one of them gets out of control: (1) production of agricultural crops, (2) profits, (3) the fertility of the soil, (4) the security of the land users.

The Agricultural Adjustment Act was designed to control the first two of these elements, production and profits. The Triple A's main job was economic. It was an attempt to balance the economics of agriculture. It hoped to achieve this balance by limiting crop production, and, at the same time, paying the farmers for reduction. Thus, when the cotton planter cut down his cotton acreage by a third, he was paid by the federal government an amount equal approximately to the market value of that one third. The same process was used to reduce the acreage of wheat and corn and the number of hogs grown. This was an emergency law to stave off the disastrous effects of the economic depression.

Mr. Hoover's Agricultural Marketing Act had attempted much the same thing. The chief difficulty was that the Hoover act attempted to reduce crops by asking the farmers to cut down, while at the same time stimulating overproduction by

paying artificially high prices for surpluses. The Agricultural Adjustment Administration, on the other hand, reduced the surplus by *paying* the farmers to do it. This was one of the chief reasons this act succeeded as well as it did in reducing crops. Another reason for farmer coöperation with the Agricultural Adjustment Administration program was the fact that paid-for crop reduction caused higher farm prices. The commercial farmer who needed every bushel of his cash crop in order to pay his annual expenses, could afford to reduce this crop only when the crop reduction did not mean income reduction.

Whether or not this law would have solved the agricultural problem will never be known. The Supreme Court in 1936 decided that the basic prop of the Agricultural Adjustment Administration was unconstitutional. This was the processing tax. The processing tax was a tax levied by the government on all manufacturers who made raw agricultural products into finished goods. This meant that the millers who ground wheat to make flour, or the textile factories which spun cotton into cloth for shirts had to pay a tax on the raw wheat and cotton they used. This tax provided the money with which to pay the farmers for reducing their crops. The Supreme Court ruled that such a tax was illegal. Thus this most notable use of taxing power of government to aid the farmers ended.

Another thing which prevented an accurate test of the Triple A crop reduction program was the severe drought in 1934-36. This made the crop reduction efforts of the Triple A seem puny. During those weeks of relentless burning sun, thousands of acres of wheat wilted and died. This drought pointed out one serious flaw in the Triple A program. That flaw was the possibility of weather destroying so much of the reduced crops that there would be a shortage.

Agricultural Adjustment Acts in 1937 and 1938 tried to get around this possibility by what is known as the "ever-normal granary" plan. This law provided that the Secretary of Agri-

culture could decide how much acreage should be planted to avoid a crushing surplus. (See pages 88-89.) This total amount was then divided among producers. Those farmers who agreed to accept this limiting were then eligible for payments by the government. These payments were a direct grant; they did not come from processing taxes. The amount of these payments was determined by the amount of crop land the farmer kept out of production and the amount of soil restoring crops he substituted for soil depleting crops. The government also agreed to lend money to the farmers, the amount of the loan being based on the amount of the farm crop which was stored on the farm rather than sold.

At the same time, the farmer was given a chance to insure his crop. Crop insurance works this way. The government takes the surplus crops produced in good years and gives them back to the farmers in the bad years if their crops are destroyed by weather or insects. This law applies to only wheat, but may later be extended to other crops which can easily be stored.

In case of large surpluses of cotton, corn, wheat, tobacco or rice, the farmers were allowed to vote to declare that only a certain amount of a crop should be sold. Each farmer was then given a quota which he could sell. Any farmer selling more than his quota would be penalized by the government. This penalty was a tax on the amount of a crop sold in excess of the quota.

Before the Supreme Court decision of 1936 the Agricultural Adjustment Administration paid farmers to reduce their crops. Under the new system, they paid the farmers to save the soil. But in order to save the soil it is necessary to reduce the ordinary commercial "soil-depleting" crops such as corn, wheat, cotton, and tobacco, and to alternate them with soil conserving crops such as clover and alfalfa. Therefore, by paying the farmers to save the soil, the Agricultural Adjustment Administration was actually paying them to reduce the



crops that produce the most troublesome surpluses. This plan also had the object of diversifying farm crops, thus getting away from the basic mistake of one-crop farming.

By midsummer of 1938, headlines like this were appearing in the newspapers. "Huge Wheat Crop Tests AAA Policies. The Puzzle Is How Many Bushels Can Be Kept Off the Market To Avoid Price Crash. Effort To Push Exports."<sup>67</sup> The problem suggested by this headline can be put down simply as a problem in addition. That problem would look like this:

*Wheat Taken Out of the Market by the Agricultural  
Adjustment Act*

100,000,000 bushels through wheat loans	
30,000,000	" crop insurance
25,000,000	" to be bought by the government to feed the needy
650,000,000	" for domestic consumption
<u>805,000,000</u>	" total needed
1,167,000,000	" in 1938 crop (including 200,000,000 bushels left from previous year)
805,000,000	" needed
<u>362,000,000</u>	" surplus

There were 362,000,000 bushels more wheat than could be taken care of by domestic consumption and the Triple A. That explains the last sentence in the headline, "Effort To Push Exports." The only way for the government to get rid of that wheat was by exporting it. But export markets to absorb such a large surplus are hard to find today.

A few days before this headline about wheat appeared in the newspaper, the following dispatch from Rome was printed: "June 16. The government today suspended regulations calling for the use of 20 per cent corn flour in bread and issued a sub-

<sup>67</sup> *New York Times*, July 24, 1938.

stitute order that wheat flour henceforth be 20 per cent coarser.

"The use of corn flour had been ordered to conserve wheat as a result of this year's poor crop. A scarcity of the substitute, however, led to the change in regulations.

"The fact that the United States and other countries have bumper wheat crops is of scant solace to the Italians. Italy is bound to a self-sufficiency program and is determined to stretch her own sparse crop as far as possible, importing only what is absolutely necessary."<sup>68</sup>

Italy is not the only country cutting her imports. No nation wants to buy from another more than it can help. The question is what can be done with a surplus like that of 1938. To sell it in the United States means that the price will drop so low that farmers cannot make a profit. No one abroad wants it.

#### LAND MANAGEMENT

While the Agricultural Adjustment Administration was trying to balance markets, another government agency, the Soil Conservation Service, was trying to balance the needs of the soil. The Soil Conservation Service had made a good beginning as an emergency public works unit in the Department of the Interior. After a short while, it was transferred to the Department of Agriculture, since its activities were so clearly a part of the agricultural program.

The main job of the Soil Conservation Service was to stop soil erosion. It attacked the farm problem from the point of view of the balance of nature, while the Agricultural Adjustment Administration attacked it from the point of view of the balance of economics.

The chief tool of the Soil Conservation Service was what is called "the demonstration project." In various parts of the country where the erosion problem was acute, the Soil Con-

<sup>68</sup> *New York Times*, Section 4, July 24, 1938, p. 7.

servation Service selected watersheds ranging from 20,000 acres to 100,000 acres. It made contracts with the farmers in these areas and with their help worked out the many technical methods required to stop erosion and restore the fertility of the soil. The Soil Conservation Service believed that once the local farmers could see the success of these activities they would adopt similar practices for themselves. At the same time the Soil Conservation Service believed their work should help the general public to realize the gravity of erosion and the importance of controlling it.

This was an approach to the problem partly by the old method of education; partly by the new way of helping the farmers to follow certain practices. Clearly, the Soil Conservation Service realized that education alone was not always enough. It developed a sort of compromise between the two systems.

If a farmer signed a coöperative agreement with the government promising to follow certain soil conserving measures and practices for a period of five years, the government, through the Soil Conservation Service, would assist him in putting these measures or practices into effect. For example, the Service might furnish machinery and labor for the construction of terraces and terrace outlets. A large part of this labor was done by boys in the Civilian Conservation Corps under the direction of Soil Conservation Service engineers. In addition to the labor and machinery, the Soil Conservation Service might furnish limited amounts of such materials as seeds and fertilizers for the seeding of terrace outlets, gullied areas, or land retired from cultivation. The general rule, however, was that the farmer's contribution must equal or exceed that of the government. Thus the Soil Conservation Service assisted the farmer in improving his methods of land use. From the point of view of the Soil Conservation Service, this farm was now a demonstration of good land use which the farmer's neighbors could

see and follow, for the Soil Conservation Service made a point of doing this work only in those regions where it would serve as an example to convince other farmers of the value of good soil conservation practices. From the point of view of the farmer, the government had assisted him to make immediate improvements on his land which he probably could not have made unassisted for a long time.

The activities of the government under the Soil Conservation and Agricultural Adjustment Acts might be called a permanent land use program aiming to establish a permanent balance. Agriculture was in such a bad state, however, that certain temporary projects were started giving immediate and direct assistance.

#### EMERGENCY FARM AID—MONEY

What we call the temporary acts can be divided into two classes. The first class was a series of laws to help the farmers out of debt. The second class was concerned chiefly with providing the farmer with productive land.

An investigation of the farm debt must begin with a discussion of credit. The credit problem can be solved in two ways. The first way is by lending money at a low rate of interest. Since the administration of Andrew Jackson the federal government has dabbled with various schemes which it was hoped would provide the farmer with the money he needed. During Woodrow Wilson's administration the Federal Land Banks were established. These were banks partly supported by government funds. Their primary purpose was to lend money to the farmer at a low rate of interest and with a long period for gradual repayment.

Since Wilson's administration the number of these banks has been increased, and it has been made easier for the farmer to borrow from them. However, the farmers needed more than these banks could supply. Consequently the farmers bor-

rowed elsewhere, and when they couldn't repay this money, the lenders proceeded to take the land away from the farmers.

This became a very serious problem in 1933. The Roosevelt administration attempted to solve it by two methods: first, by persuading creditors to reduce the principal of the loans and the interest charges, and second, by lending money to the farmers to pay these debts. The farmers were allowed to repay the government over a long period of years and at a very low rate of interest. To handle these and many other agricultural credit problems, the Farm Credit Administration was created.

For farmers who lost their land, or who are working land which is sub-marginal, the Farm Credit Administration and the Federal Land Banks are no help. Banks felt that they could not safely lend money to such farmers. The government decided that the problem was primarily one of land rather than of money. It decided that the solution was to provide sub-marginal farmers with fertile land. For tenant farmers, the government decided to work out a system which would enable them to buy land. This is the new approach to farm credit.

This program can be broken down into three parts. First, there is the Farm Security Administration (originally the Resettlement Administration). The program of Farm Security has been to resettle farmers who were living on sub-marginal soil and to aid other farmers to make the best of the land they were on. The Farm Security Administration arranges for farmers living on sub-marginal land to establish themselves on good land. Sub-marginal land is bought by the government for public forests and parks, the only purposes for which it was really suited. Thus a farmer who lives in the dust bowl can apply for help to the Farm Security Administration. It will help him secure new land, which he is permitted to pay for over a period of forty years.

There would be little use in resettling farmers from sub-marginal land if they were to use their new land so badly that

it too would be sub-marginal in a few years. Therefore, in order to make its temporary policy of resettlement fit into a permanent policy of balanced land use, the Farm Security Administration lends money with the understanding that the new land will be used in such a way that its fertility will be preserved.

The second point of this program carried out by the Farm Security Administration was to reestablish farmers on their own land. It lent money to farmers so that they could get back on their feet again. Even more important, it helped these farmers to make intelligent management plans for their farms. The borrowed money must be repaid in five years, but if at the end of that time the farmer still cannot pay his debt he is given another five years to make the debt good. This plan is called rehabilitation. Loans for rehabilitation are used by the farmer to buy such things as livestock, seed, fertilizer, feed, and implements, which farmers with low incomes often lack.

Another attack on the problem of farm insecurity was the Bankhead-Jones Farm Tenant Act, which was passed in July, 1937. This law was an attempt to solve the problem in three ways. The first part of the act authorized the Secretary of Agriculture to carry out a plan to overcome the growing trend of farm tenancy. For this purpose Congress appropriated \$10,000,000 in 1937-38, \$25,000,000 for 1938-39, and \$50,000,000 for each year after that. This money is lent to tenant farmers to buy land. In each community, tenants apply for loans and a local committee selects those applicants who seem to be best fitted to receive this aid. The tenants are given as much as forty years to repay the loans at a 3 per cent interest rate.

The farms which the tenants buy are selected from the land previously purchased by the government. For five years after it is purchased, the government holds the right to take back the farm if it is not used properly. And during the whole period the farmer owes money for the farm, the Secretary of Agricul-

ture may supervise the farming operations. The purpose of this is to help the farmer develop a balanced system of land use. Furthermore, the supervision of the Secretary of Agriculture should insure the protection of the soil fertility.

The second part of the act carries on the work of rural rehabilitation of the Farm Security Administration. Money for this purpose must be allotted by the President from relief funds, as the need for it arises. This act permits the government to make loans to farmers in need. The loans must be repaid in five years and the rate of interest is again 3 per cent. If the farmer is unable to repay the loan in five years, he may renew it for another five years.

The third part of the act authorized appropriations of \$10,000,000 in 1938 and \$20,000,000 for the next two years for a broad program to buy sub-marginal land and develop better methods of using it. This land is being taken out of poor farms and converted into livestock ranges, pasture, forests, wild-life preserves, and recreation areas. The purpose of this program is to remove from cultivation land that is not good enough to farm, but which will contribute to the community if properly used.

The Department of Agriculture has itself admitted that this program is only large enough to start a trend in the right direction. It is not a solution. In the case of sub-marginal lands, the land classification surveys indicate that there are some 86,000,000 acres of land being used for farming that do not yield enough crops to support the families who work it. The \$50,000,000 authorized by the Bankhead-Jones Act could buy but a small portion of this. As for the problem of tenancy, between 1880 and 1935 there were on the average 33,465 more tenants every year. If all of these new tenants were lent \$4,000 to start farms of their own—a comparatively small amount of money for that purpose—it would take \$133,860,000 a year just to take care of the annual increase of tenants.

## STATE CONTROL OF LAND USE

As we have seen, within the past few years, the attack on problems of land use has shifted. The idea of expanding has given way to the idea of controlling the use of land. With the exception of Wisconsin, most states were unprepared to undertake this control. The chief reason for Wisconsin's control program was the collapse of a land boom that left a large stranded population on unproductive land. In many cases the states could not make up their minds how to go about controlling land use, if they were aware of the seriousness of the problem at all. But even if they could have agreed upon a plan, many states burdened with eroding soil, growing farm tenancy, and indebted farmers did not have enough money to finance a land control program. Not infrequently this poverty was the result of low revenues from worn-out land. States in this condition had to depend on the federal government to help them out of their difficulties.

There are two other reasons for the development of federal control of land use: (1) Soil erosion, for example, does not pay any attention to state lines. The southwestern Dust Bowl includes parts of Colorado, Texas, Kansas, and Oklahoma. (2) The economic problems attacked by the Triple A affect farmers all over the nation in much the same way. Obviously, states cannot control the price of grain or cotton. The federal government, on the other hand, has attempted to do just that.

Once the heavy first costs are paid by the federal government and the machinery of land management is set in motion, there are many parts of a land use control program which can be run by the states and private owners. From the point of view of the federal government, the question was how to pass this power of controlling land use over to the states without letting the land continue to decline because the states cannot or will



not carry out a land-use control program. The answer to this was the Standard State Soil Conservation District Law.

#### SOIL CONSERVATION DISTRICT LAW

Early in the 1930's the farmers of the Piedmont Region of Alabama decided to pool their resources and buy the equipment necessary to stop erosion on their land. They organized terracing clubs which raised the money to buy bulldozers and terracers and other machinery which is used in building terraces to hold back the flow of water down hillsides. The idea spread to Georgia and other states.

The Department of Agriculture took up this idea of land use planning within the states shortly after the Supreme Court decision against the first Agricultural Adjustment Act had checked federal land-use control plans. With this new idea as a beginning, the Department of Agriculture developed the Soil Conservation District plan. The Department drew up a model law based on this plan for the states to consider and adopt. This was the Standard State Soil Conservation District Law.

So far twenty-six states have passed laws providing for the organization of Soil Conservation Districts. Briefly, this is how the law operates. Twenty-five or more occupiers of land may petition the State Soil Conservation Committee for the formation of a Soil Conservation District. After hearings are conducted, the land occupiers of the proposed district vote on whether they want to form such a district. Before a district can be set up, a majority must vote for it.

The Soil Conservation District has its elected supervisors who are in charge of the land-use program in that district. They may provide the farmers with technical or financial assistance in carrying out a soil conservation program. The supervisors may propose land-use regulations and set up penalties if they are violated. These regulations cannot be put into effect, how-

ever, until a majority of the land occupiers in the district vote in favor of them.

With this power to force people to carry out a land-use plan there is a section of the Act which enables land occupiers to appeal to a board of adjustment and even to the state courts, if they feel that the regulations of the district cause them unnecessary hardships. The district may be discontinued upon an affirmative vote of a majority of the land occupiers.

The Soil Conservation Service, as well as other federal, state or private agencies, may coöperate with the Soil Conservation Districts upon request of the District supervisors, and assist them in carrying out a soil conservation program.

There are two important things to notice in this law. The first is that a majority of the people in a district can work out a solution of their land-use problems. At the same time the rights of a minority in such a district are protected. The second is that in about one-half the states where soil conservation district laws have been passed, tenants have equal voting rights with landowners. In other states, however, only owners of land may vote.

Once it has been set up, the Soil Conservation District becomes a unit of government just as a county is a unit of government. This is a very important point. The recent development of groups to manage the use of land is a change in our government structure. The Soil Conservation Districts, the Grazing Districts, water conservancy districts, and many other units of land use which are discussed later in this book, all have a certain governing power. Up until the time when these new units were created, our government was set up on what are called political units, that is, the township, the county, the city, and the state. The basis of a political unit is convenience, that is, each political unit represents an area of land or a number of people which can be efficiently governed. The new units of government, such as the Soil Conservation Dis-

trict, are set up with the idea that each district will be able to handle the problems of the use of the land most efficiently. Thus, there is added to our political units of government the land-use units of government.

#### ZONING.

Several states, particularly Michigan, Wisconsin, and California, have worked out another solution for the problem of the controlling of land use. This is called zoning. According to the best known of the zoning laws, that of Wisconsin, the people of a county can decide on a land-use program, pass it by a majority vote, and set up a governing agency to carry it out. (See p. 260.) The great difference between zoning and the Soil Conservation District Law is that the zoning law tries primarily to control unoccupied land in the area. The Soil Conservation District Law, on the other hand, regulates the use of occupied as well as unoccupied land. In other words, the zoning law does not directly affect the land-use methods of the farmers who are already settled in the district. The Soil Conservation District Law, however, may set up a series of rules to govern the methods of all the land users in the district.

#### LAND-USE PROGRAMS ARE FITTED TOGETHER

As the government land-use agencies multiplied, the problem of administration became more and more difficult. Within the Department of Agriculture itself it was hard to keep the various land-use programs of the many bureaus from conflicting. The Agricultural Adjustment Administration might have been paying a man to fertilize fields that the Farm Security Administration was trying to retire as sub-marginal land. The Soil Conservation Service could be increasing crops on land while the Agricultural Adjustment Administration was attempting to reduce those particular crops to relieve a glut on the market.

In the fall of 1938 the Secretary of Agriculture announced that from that time the land-use agencies would be unified in one program. To the Bureau of Agricultural Economics went the job of working out the plans for the land-use program (see page 278). Under this new arrangement, the plans began in the region in which they were to apply. Local committees could draft a scheme of land-use management which would then go to the county committee for changes and approval, and from there to a state committee which would adjust the local plan to fit in with the plans for the state as a whole. From there the plan would be sent to the Bureau of Agricultural Economics for final revision and adjustment to the plans for the whole nation.

In addition to this, the Bureau of Agricultural Economics has been given the job of planning for rehabilitation, stability of farm prices, markets and output, security for the farm tenant and owner, farm forests, and wildlife.

Once the plans are worked out, they are turned over to one of these six agencies to be carried out: the Agricultural Adjustment Administration, the Farm Security Administration, the Soil Conservation Service, the Forest Service, the Biological Survey, the Bureau of Public Roads. It is the job of these divisions of the Department of Agriculture with the help of the Agricultural Extension Service to make the plans of the planners into actual facts.

According to this new set-up, the work of the Agricultural Adjustment Administration is clearly restricted to the economic problems of land use. Its activities fall into five general sections. First, it controls the program of adjusting the acreage of crops planted to the needs of the markets and the needs of the soil. Since its beginning, this has been the main work of the Agricultural Adjustment Administration and the reason for the word "adjustment" in its name. The backbone of this program, as it has always been, is the "benefit payment to the farmer who follows the adjustment program."

The second part of the Agricultural Adjustment program comes under the heading of the ever-normal granary plan. This plan is made up of three main ideas, the commodity loan, crop insurance, and marketing quotas (see page 70). These three projects were designed to adjust agriculture to the problems that may come with future droughts, bumper crops, and similar unpredictable changes of nature. The marketing quotas particularly were supposed to keep a balance between world production and world markets. They apply only to wheat, cotton, corn, tobacco, and rice, and, as we have seen, can only be used when two thirds or more of the producers of these crops agree to accept them.

In addition to these two programs, the new Agricultural Adjustment Administration has charge of handling surplus crops which reduce prices in the regular farm markets. This puts the Surplus Commodities Corporation directly under the Agricultural Adjustment Administration. The majority of these surpluses are distributed through relief programs to the needy and unemployed. Another job of the new Agricultural Adjustment Administration is to work out better marketing of crops so that the producers will get more for what they grow. Finally, the Agricultural Adjustment Administration has been given the control of the government division which is trying to find new markets and uses for agricultural products.

The Farm Security Administration has the job of making the farmer secure on his land. It makes loans to farmers for rehabilitation (see page 75). It administers that part of the Bankhead Jones Farm Tenancy Act (see page 76) which helps tenant farmers to make long term leases with landowners, or buy land of their own. In the case of farmers on hopelessly unproductive land, the Farm Security Administration has the power to grant relief money. The important thing about the loans offered by the Farm Security program is that no loans

are made unless the farmer agrees to follow a farm management plan for better land use.

The Farm Security Administration and the Soil Conservation Service together have charge of carrying out the water facilities program (see page 126). That, however, is the only physical land-use program with which the Farm Security Administration has any direct connection. The new organization of the Department of Agriculture gave to the Soil Conservation Service the job of actually carrying out all its other land-use operations on farm land.

The Soil Conservation Service now has control of the program of purchasing and developing sub-marginal lands for their highest use. Erosion control, farm flood control, farm forestry, and similar land-use projects are all under this Service. The federal government assists such land-use projects as the state and county zoning programs, coöperative grazing associations, and soil conservation districts through the Soil Conservation Service. In addition to this work, the Soil Conservation Service continues with its first task of managing demonstration projects.

Like the Farm Security Administration, the Forest Service shares one of its activities with the Soil Conservation Service. This is the flood control program which is under the Department of Agriculture and the War Department jointly. The War Department has charge of the downstream flood control projects, that is, the engineering part of the program. The Department of Agriculture is concerned with flood control at the headwaters of the stream (see page 116). There are two main sources of floods in headwaters, eroding land and cut-over forests. From this it is clear why the protection of these headwaters has been turned over to the Soil Conservation Service and the Forest Service jointly, since they are the chief government agencies working with this kind of land. In addition to this work, the Forest Service has its regular program of forestry and range protection (see pages 165 and 199).

The Biological Survey continues with its program of creating refuges for wild life (see page 217). It has the problem of adjusting the game supply to our methods of land use.

The Bureau of Public Roads has the job of seeing that the farmers can get their produce to markets. Federal roads are arteries through which flow a large portion of the products of the land. Without these roads, the farmer is cut off from his market. Thus, the planning and building of roads is an important part of land-use planning. The Bureau of Public Roads bases its decisions on where and what kind of roads should be built upon detailed studies of present and future needs of the people and industries served.

#### THE CIVILIAN CONSERVATION CORPS

The best plans in the world are useless if they cannot be carried out. Someone has to do the actual work of controlling eroded land, building bird refuges, checking forest fires, and rebuilding irrigation ditches. The tool which enabled the federal government's land-use planners to make their plans a reality was in many cases the Civilian Conservation Corps. In practically every land-use project the "CCC boys" were called on at some point to dig or build or swing an ax.

The Civilian Conservation Corps Camps were divided among the various government land-use agencies to work on their projects. Thus the government provided the labor which was so necessary to start the long process of rebuilding the foundation of American life, the land.

If you could add up the effect of all these government activities and then subtract all the things which are destroying the fertility of the soil and the security of the farmer, you would have an idea of whether or not these government programs were successful. Unfortunately, the answer is not just a matter of simple arithmetic. It must be in terms of government, economics, and soil fertility. So far as government is concerned,

all of these attempts to regulate the use of the land must be a part of the democratic process. This means that the policies carried out by the government agencies must reflect the will of the majority of the people. They must work no hardship on one group for the benefit of another. They must protect the personal liberty of individuals. From the point of view of economics, they must provide a fair income to the farmer without placing an undue burden on the consumer. They must also give the tenant farmer a chance to own his land, the sub-marginal farmer a chance to have a part in what politicians talk so much about—the abundant life. From the point of view of soil fertility, they must stop erosion and the waste of land. They must find a way of preserving the basic resource of our society, which is the land. When all those things have been accomplished, one thing will be clear: such a plan will balance accurately the needs of man and the needs of the soil. One way of finding out just how these various government bureaus are trying to accomplish this very complicated end is to put yourself in the shoes of the man who is directly affected by their work, that is, the farmer.

#### THE FARMER

Suppose you have a farm in Wisconsin. About 150 acres of it is good bottom land, and about 25 acres is cut-over land, and another 25 acres is land washing down into the tributaries of the St. Croix River. You raise corn, hogs to eat the corn and sell as pork, hay and small grains to feed your dairy cattle. In 1932 you were broke, or so close to it, it didn't make much difference. You couldn't sell your milk, your hogs, your corn, or your wheat. You hadn't any money to stop the washing on the eroding 25 acres. You owed \$1000 on 50 acres you bought in 1918, and the bank was threatening to take the land away from you.

In the late spring of 1933 the county agent comes around



and tells you that the Department of Agriculture is going to pay you if you will cut down your crop acreage. This may sound strange from the county agent, who up until now has been explaining how to increase crop yields. You decide you'll go along on this program. You sign a contract guaranteeing not to plant that 25 acres in wheat which you have prepared to drill.

That summer prices go up a bit. You get more for your milk and grain, but you have to pay a lot more for the paint and machinery you need. You decide that in order to get your equipment in shape you will apply to the federal government for a rehabilitation loan. The government gives you the money, which you agree to pay back in five years, and you go out and buy more paint and machinery.

Things are beginning to look better. You get more for your crops. The Agricultural Adjustment Administration payments come in pretty handy and the easy term loans from the government have put you back on your feet.

Then the Supreme Court announces that the Triple A is unconstitutional. A few weeks later the county agent comes around again. This time he has a new idea. The federal government is going to pay the farmers for saving their soil. You can see that this is an indirect way of reducing surpluses on the agricultural market, for saving the soil often requires planting crops you can't sell instead of crops you can sell. Of course, you know that it's quite true that if you plant alfalfa on your corn land the alfalfa will return a lot of valuable nitrogen to the soil which the corn would have taken away. At the same time, the alfalfa will keep the soil from washing away while the open corn rows would wash out in every heavy summer rain. You decide to sign up again.

About a month later you are called to a meeting of the farmers of the area to vote on the problem of crop allotments. The new law says that you will not get soil conservation

payments if you increase the acreage planted in crops you can sell. Your county has been allotted a certain acreage for corn and wheat. This acreage is a little less than people usually plant, so that all of the farmers have to cut down a bit in their production.

A good three quarters of those present vote to accept this plan. While you are at this meeting, you elect a farmer to represent you in the county committee. This committee is composed of farmers, the county agent, and the Triple A man who will work out the details of the agricultural conservation and crop reduction program for your area.

A few weeks later you get a work sheet. This is a plan to be filled in by you showing just what you're going to plant, where you're going to plant it, what fertilizer you're going to use, and so on. When fall comes one of the local farmers hired by the county committee calls to see just how you have carried out this plan, if you have met all the government requirements for using fertilizer on the worn-out land, for planting clover on the eroding 25 acres, for fencing your cattle out of your woodlot, and so on. The government pays you a certain amount of the cost of the seed, fence, and fertilizer you have had to use. The amount it pays you depends on what you do and the total acreage of your farm. The total payment is not more than \$1 for each acre tilled. Since you have 200 acres of crop land, the most you can get is \$200.

One day in the fall of 1936 a man from the State Conservation Department drives up with a ranger from the National Forest in the next county. They start to talk to you about the Conservation District Law. The idea, they say, is to work out a plan of land-use management for the region in which you live. You learn that already a petition signed by your neighbors has been sent in asking for the right to form such a district.

You decide that this is a good idea. Various land-use experts have been making a survey of the county land resources. You

and your neighbors approve of the plan which they have drawn up for land-use in the newly laid out district.

One winter night after the district plan has been accepted you and your neighbors meet in the school house. You lay out and agree upon a general set of rules governing land use in your district and elect supervisors to manage the plan and see that the rules are enforced. With the advice of a soil conservation expert, who has been working on a nearby demonstration project, the final details of the district plan are worked out. After all objections to the plan have been heard and adjusted the plan is finally put to work.

By 1938, crop prices are beginning to sink. You aren't so well off as you were in the first days of the Triple A. Machinery prices are high. The mower you could have bought for \$90 last year costs \$100 this year, and so on. According to all reports there is going to be an over-supply of grain and dairy products. Then a new Triple A law is passed. According to this there is going to be crop insurance, marketing quotas, conservation payments, and commodity loans.

If you want to limit the amount of wheat that is to be sold in the United States, you can vote to give the Secretary of Agriculture the power to set a quota, beyond which farmers cannot sell wheat without paying a penalty tax. If you feel like it, you can sign up to limit your crops, plant soil-conservation crops, and as a result get a soil-conservation payment. This plan is very similar to the crop allotment plan of the year before. The only real difference is the penalty tax which has been added to help enforce marketing quotas. Like the old plan, it can be put into action only if three fourths of the farmers concerned vote to accept it.

If you need cash to tide you over until prices go up you can get a commodity loan from the Department of Agriculture. The amount you can get depends on a thing called parity price, a figure determined by the Secretary of Agriculture. It is based

on the selling prices of farm products and the cost of industrial products bought by the farmer. For example, the Secretary of Agriculture may decide that under normal conditions a hundred bushels of wheat should buy a mowing machine. Say the mowing machine costs \$100, then wheat should be worth \$1 a bushel. Now suppose the price of the mowing machine goes up and the price of wheat goes down, so that the actual price of the mowing machine is \$150 and the actual price of the 100 bushels of wheat is \$50. The parity price of the wheat, however, would be \$150, since parity price in this case means that the price paid for 100 bushels of wheat must equal the cost of the mowing machine. Parity price is really a balance between two kinds of commodities. In this simplified instance it is a balance between wheat and mowing machines. If the actual price of wheat drops to 52 per cent of parity price, the federal government can lend you up to 75 per cent of the parity price. Thus if the parity price of wheat for any month is \$1.50 a bushel and the actual price of wheat is 75 cents, the actual price is less than 52 per cent of parity price. Therefore the Secretary of Agriculture can give you a commodity loan on your wheat. He can lend you up to 75 per cent of \$1.50, or \$1.12½ a bushel. The hundred bushels of grain will be turned over to the government and you will get \$112.50.

If you think there is danger of drought or insects ruining your crop, you can apply for crop insurance. This system works like a regular insurance policy. The difference is that you insure a crop. You pay the premiums in the crop and benefits are repaid to you in crops. For instance, if your average yield of wheat is 1000 bushels, you can take out insurance with the government so that in case of crop failure you will be sure of getting at least 750 bushels, that is, 75 per cent. In good years, when you have a wheat surplus, you give the government a certain percentage of that surplus. In bad years, when your yield is

less than 750 bushels, the government gives you the difference between what you have and 750 bushels.

Thus you as a farmer, if you wish, can become a part of a complex system of land-use control. You can decide whether or not you want to accept that control. The fact remains, however, if you reject this regulation you may be taxed under the quota system. Furthermore, competing farmers will be given government funds to help them pay their bills. In other words, the government is putting pressure on you to induce you to accept control of land use.

#### THE FARMER LOOKS AHEAD

At present the foreign market for American agricultural products consumes the output of 40 to 45 million acres of farm land. The domestic market uses the products of another 305 million acres. Since there are 365 million acres under cultivation today, this means that there is a surplus of between 15 and 20 million acres.<sup>69</sup>

The people of the United States live on a relatively low grade diet. This means that the average American does not get the kind of nourishment that promotes the best health. Also it is estimated that 85 per cent of the world's population does not have enough food and that the food they do have is of a poor quality.

A change in diet could mean a change in crops. For example, a former sharecropper in the South could raise vegetables and a few milk and beef cows for himself, as well as cotton, on a government-financed farm. This would raise his standard of living, since today he rarely gets beef or milk or fresh vegetables. But he must have enough land left to grow cash crops which he would have to sell to pay his taxes, the interest and principal on his loan.

<sup>69</sup> *The Farmer Looks Ahead*, op. cit., p. 7.

Americans eat more pork than beef. They would be healthier if they could afford to reverse this diet and eat more beef. The chief reason for the predominance of pork over beef is not choice, but the fact that pork is cheaper.

Suppose that for some reason the price of beef should drop so low that it could be substituted for pork. This would not only improve the national health, it would be a boon to the land. Take the corn-hog belt for an example. A shift there from corn and hog production to cattle raising would mean cutting down the proportion of land in corn and turning it into pasture. The pastures would resist erosion better than corn, and restore fertility to the soil. The raising of beef would also mean that there would be an increase in the number of acres of land in profitable use for this reason; it takes 75 acres to grow 100 lbs. of beef while only 37 acres are needed to grow an equal number of pounds of pork. Thus increased beef consumption would mean more land in production, improved diet, and stable soil.

One way to bring about a change in diet is by twilight farming, the cultivation of a small farm or garden by a factory worker during his spare time. More and more people are doing this. Unfortunately for regular farmers, the growth of twilight farming has reduced retail food markets. Another way a change in diet can be brought about is by increasing the wages of food consumers so that they can afford to buy more and better food. Such an increase in food consumption would be a great aid to the farmers. However, it is uncertain whether city people will be able to afford more food. If they cannot, the farmer's outlook is not particularly bright. The reason for this is that there will be more than enough soil under cultivation to feed the probable population of the United States when it will have reached the peak. At the same time, the number of farmers will have increased faster than the number of city people. Furthermore, if more efficient farm machinery is invented, even fewer farmers will be able to grow enough food for the increased popu-

lation. On the other hand, an increase in national income and a more equal distribution of that income would probably lead to an increase in food consumption, bring a larger income to the farmers, and put more farmers to work feeding the population.

An eastern newspaper once ridiculed a western farmer for saying that the chief causes of agricultural troubles were the automobile and the tractor. Before he made his sarcastic remarks, the eastern editor might have done well to look up the actual effect of the automobile and tractor on farming. The gasoline engine has displaced horses and mules which consumed the products of 35,000,000 acres of land. Figure it out for yourself. The automobile and tractor destroyed a market for the crops from 35,000,000 acres. The surplus crop acreage today is between 15 and 20 million acres.

But if an invention like the automobile can destroy an agricultural market, another invention might restore it. If, for instance, corn fodder could be made into a fuel or building material or rubber, there would be an industrial market for these products which would absorb the surplus crop. That is a future possibility. A division of the Department of Agriculture is exploring these possibilities with the idea of turning them into realities. The industrial market for farm products today, however, shows no sign of taking up the slack.

#### THE AMERICAN PEASANT

When you think of our over-expanded acreage and inadequate markets, there seems to be a good chance that the surplus farmers will be left living on the sub-marginal land. They will either be tenants, or landowners in danger of losing their land because they cannot make enough to pay their expenses. In other words, there may be a large American peasantry, one of the great social evils which originally drove people to America.

Now the question is how to avoid this future peasantry. In

fact, in some areas like the cotton-growing South, the peasantry is already here. Some people think that the solution is for the farmer to return to the methods of the previous generation, when he was not dependent on a cash crop. Then it was a matter of raising everything that was needed. It is difficult to see how farmers can be expected to return to such a method and still maintain a standard of living much above that of a peasant. After all, it is impossible to grow automobiles, electricity, telephones, and the thousand and one other things which the people of the twentieth century have come to believe justly belong to them.

Another group of people believe that the solution lies in providing productive soils for people living on sub-marginal land, and then seeing that this soil remains productive. Such a program depends on one thing, markets. If all the farmers are put on good soil, someone must be able to buy what they produce. Since there is little immediate prospect of expanding the foreign market for American agricultural products, it is necessary for the domestic market to absorb the products of our soil. Doubtless, if everyone made enough money, all of the food produced by American farmers could be consumed in this country. However, the fact remains that everyone does not have enough money. And since they cannot buy the farmers' goods, the farmer cannot buy the factory workers' goods, and there is the problem.

A third group of people say, "We may as well face the fact that agriculture in America is doomed. The American farmer is going to cease to be an important part of American society, just as the English farmer has ceased to be an important part of English society. You can't have industrial and agricultural development in the same country at the same time." All of that may be true enough, but look at England today, frantically collecting a store of food to keep her alive in case of war. And there are plenty of people living in England today



who can remember the starvation rations of the last war, starvation rations because English farmers could grow but a small percentage of the food needed in the British Isles. And England has a vast colonial empire to which she can look for her food supply. America's colonies could not supply the need if American farmers should give up their land.

There is a middle ground between these extremes. It is not impossible to establish a balance of nature and a balance of economics on the land. One step toward such a balance is a method of land-use management that preserves the fertility of the soil. A second step is balanced crop production which would reduce surpluses and restore profits to agriculture. Finally, an increase in the buying power of the average American would create the larger market our farmers need today. And to make this possible the American people must create the social institutions by which this balance of man and the land can be established.

Regardless of what various groups of people may predict for the farmer and the future of agriculture, two things seemed fairly clear by 1935. The farmer was unable to help himself, and the government decided that it was its duty to come to his rescue.

People who believe that the least government is the best government disapprove of this development. But the farmer who sits in his dust-filled shack in North Dakota and looks out at his cornfield, which to anyone else looks more like a sandy beach, can't help himself. Fifty years ago he might have moved somewhere else. Today he must make the best of a bad bargain. He is the last of the pioneers. If he is to be made into a stable, reasonably prosperous, intelligent worker of the soil, he must be helped out of that pioneer stage where the soil was a mine, and into the stage of stability where the soil is the basic resource for him and all the generations which will follow him. The state and federal governments are the only agencies so far that have been able to do this.

And the Alabama sharecropper, who has to grow cotton up to his doorstep to satisfy the planter for whom he works, and still ends the year in debt, must be helped too. He has been caught in a system of agriculture which was based on slavery, and which has never really adapted itself to any other method.

And the Tennessee farmer sitting on his hillside looking down on the Tennessee Valley Authority dams—maybe he would rather be left alone. But what about the dams that are being filled with the silt that runs off his fields with every rain? And what about the surplus population he produces? If they come to the cities it will mean too many factory workers. A surplus of workers means low wages and unemployment. If they remain in the hills to add to the country population, they will have to adjust themselves to a lower standard of living.

And what about the farmers in the corn belt with their overflowing corn cribs and eroding fields, and the dairy farmers with their milk surplus and eroding fields, and tobacco farmers with their surplus and their eroding fields, and the truck gardeners with their surplus and eroding fields? And so on? Those will still be questions for the voters who determine the future of America to think about a quarter of a century from now. They will require decisions based on a knowledge of the problems of land use. If they are to be answered intelligently, the voters will have to be able to recognize the special pleas of groups who are selfishly thinking only of their own development—the industrialist who doesn't want any of his taxes wasted on farmers, the farmer who wants the government to support him while he continues with his soil destroying methods. And in making these decisions and distinctions, there is one fact that must always be remembered. Nature maintains its balance regardless of whether it means the wiping out of a single community, a state, or a nation.

## PROJECTS

1. In the history of your county you will find out how the first settlers took up the land in your region. See if you can find out whether they occupied the land under the Homestead Acts or the previous Land Grant Acts. Try to identify the act upon which these people based their right to the land.
2. From your county taxing office you could probably find out the growth of farm tenancy in your county, if you live in a county where there are any farms. From the region's Soil Conservation Office you can get a map or a statement telling you the extent of erosion in your region. See if you can find any relationship between the growth of tenancy and the growth of erosion.
3. One sign of whether or not the land is being used wisely is the amount of farm tenancy in the area. If there are a lot of tenants the land is frequently worn-out. Check up and find out if this is true in the county in which you live.
4. Many counties have Land Planning Boards. These boards try to work out a plan for the use of the land in the county. Find out if your county has one. See what it is doing and why it is doing it.
5. If you were selecting people to be resettled by the Farm Security Administration, what facts would you want to know about them? Suppose the people came from the Dust Bowl where they had been farmers for a great many years until their topsoil was blown away. Onto what sort of resettlement project should you like to put these people? Why?
6. See if you can figure out what would happen to your town if the basic land resource were completely destroyed. If you live in a manufacturing town, find out where the raw materials for the factories come from and try to decide what would happen if that source should be exhausted.

7. If you live in a city or town, you are under at least four different governments: city or town government, county government, state government, and federal government. Try to find out what those various governments do to regulate the use of land in the city or town. For instance, does the federal government control the rivers, or has the state worked out a plan of flood control for the city? Has the county built parks near the city? If you live in the country try to figure out just how the state and county and federal governments control the use of land in your county.
8. If you had a farm in a district under the Soil Conservation District Law and you disagreed with the regulations made for the use of your land, what should you do about it?
9. Trace the flow of power in the 1938 Agricultural Adjustment Act from the federal government in Washington to the farmers on the land.
10. Find out how many bureaus of the Department of Agriculture are in your county? What land use activities do they represent? How is their work unified? Does their work conflict with the land use activities of other departments of government?

#### DEBATES

1. Are the farmers justified in receiving special help from the government through organizations like the Agricultural Adjustment Administration?
2. Is the Agricultural Adjustment Administration a more effective way of handling the farm problem than the old educational methods under the Department of Agriculture?
3. Is the federal government justified in spending money collected from all the taxpayers to help a special group of taxpayers such as the farmers or the manufacturers?
4. Should the production of crops be controlled by an order from the Secretary of Agriculture forbidding the planting of

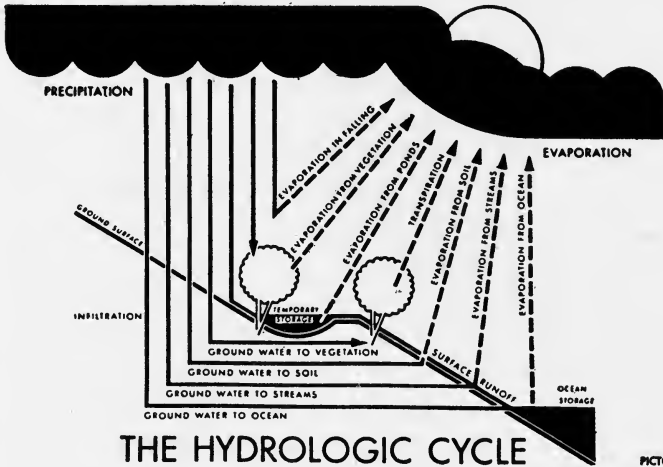
more than a certain amount, or the vote of the farmers themselves to restrict crop production? It is important to understand in this question the difficulties of collective action by individual farmers.

5. Is agriculture in the United States doomed to failure?

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100

Not all the water that falls from the clouds sinks to the underground reservoir. When more water falls on the soil than can be absorbed by it, the water runs off the surface into the streams. This water is called run-off.



## THE HYDROLOGIC CYCLE

PICTORIAL STATISTICS, INC.

*The circular route of water—from sky to earth to sea to sky.*

The second half of the hydrologic cycle shows how this precipitation is returned to the clouds from which it will again fall. The run-off and ground water flow into the rivers, lakes, and finally the ocean. Wherever this water is exposed to the atmosphere it is drawn up to the clouds. This is evaporation. A large part of the water, however, does not flow into the streams; it is sucked up by the roots of plants and exhaled into the atmosphere by the leaves. This is transpiration. This exhaled moisture is also returned to the clouds.

## THE WORK OF WATER

If you were to map this circular course of water, the route would be marked this way. From precipitation to infiltration, to ground water, to surface water, and by evaporation back to

the point of precipitation. Other routes would be from precipitation to run-off to surface water to evaporation, or from infiltration to transpiration and thus back to precipitation.

For millions of years water has been going on this endless journey undisturbed. In the process it has nourished plants to feed the land animals. It has filled the streams and ponds for the fish and water fowl.

Unfortunately, the activities of man have not always fitted in with this plan. In the process of building a civilization, man has built a barrier across the hydrologic cycle. This barrier has diverted a lot of the water from the infiltration-ground water route to the direct run-off route.<sup>2</sup>

You can understand this barrier if you consider the various ways man has found water to be useful. Mr. Thorndike Saville has listed them in what he considers the order of their importance: (1) moisture from the atmosphere which is essential to organic life, that is, all living things; (2) drinking water for man; (3) water for agriculture and the raising of animals; (4) water as a home for fish and seafood; (5) water for the generation of power; (6) water for industry; (7) water as a means of transportation; (8) water as a means of removing and purifying waste; (9) water for recreation such as swimming, fishing, boating; (10) water for political boundaries; (11) water for ice.<sup>3</sup>

Here are eleven jobs which man expects water to do for him on its journey from the sky to the earth and back again. He begins by setting water to work the minute it strikes the earth. The way in which water is used at this beginning determines pretty much how well it will do the remainder of its work during the rest of its journey back to the clouds.

<sup>2</sup> H. S. Person, *Little Waters, a Study of Headwater Streams & Other Little Waters, Their Use and Relations to the Land*, November, 1935, Revised April, 1936. United States Government Printing Office, Washington, 1936, pp. 7-9.

<sup>3</sup> Parkins and Whitaker, *op. cit.*, p. 288.



## RUN-OFF

To be of the most use to man and other organic life, rain when it strikes the earth should as far as possible be absorbed by the topsoil and then infiltrated to the ground water reservoir. Whether or not it is absorbed depends first on the amount of rain that falls at one time. Different soils vary widely in their power of absorption, but each has its maximum capacity, and if rainfall exceeds this, the soil becomes saturated and the surplus runs off. But under this maximum capacity the amount of absorption of rainfall depends on three major things. First, the cover of the earth. The litter of leaves and twigs that cover the floor of a hardwood forest has been known to absorb 95 per cent of an average rainfall. A good stand of blue grass will absorb as much as 99 per cent of the water that falls in an average rain. Close-planted crops like wheat and rye absorb a much smaller per cent of rain water. Open row crops like corn and beets absorb even less. Land that is left bare without either grass or a crop, in other words, fallow land, absorbs very little of the water that falls on it.

The main reason for such wide differences of absorptive power lies in the close partnership between plant and soil. In a virgin forest or natural prairie, fallen leaves and dead plants decay and become a part of the mineral soil. The rich, black, porous, spongy soil of an old forest is a typical example. Such soils helps easy infiltration and percolation.

Intensive land use that results in a reduction of plant cover increases the amount of surface run-off. The destruction of forest cover by clear cutting and fire, the plowing of grasslands, the planting of unbroken fields of grain or row crops, and the overgrazing of range lands are examples of bad land use that cause water to run off the surface instead of sinking into the ground reservoir. By poor methods of cultivating land man has

diverted a large part of precipitation from the absorption route to the run-off route.

The absorbing power of land is also related to the amount of slope. This is the second factor which controls run-off. Water will pour down a steep hillside more quickly than it will down a gradual hill. Practically all the water that falls in rain will run off a bare slope of 3 per cent. From this you can see that the volume of water lost by run-off may be very great even on slight slopes. The steeper the slope, the greater the speed of the running water. The faster the run-off, the more soil it will carry. Consequently, in the use of sloping land, much greater care is needed than on level land to get water into the soil and to prevent it from running too fast.

There is a third factor which affects run-off. That is the quality of the soil. Sandy soil absorbs water quickly. This means that there is little run-off. Clayey soil, on the other hand, is close-grained. When it is wet it has a smooth, slippery surface which sheds the water. Consequently the run-off on clayey soils is greater than it is on sandy soils. This is but a simple example of a very complicated process. There are many types of soils and many reasons why they do or do not absorb water. The important thing here is that the quality of the soil helps to determine the amount of run-off.

A large amount of run-off is a bad thing. There are two principal reasons for this. In the first place a high rate of run-off means a high rate of erosion. When we speak of erosion here we mean the washing away of the soil.

In the second place, when water runs off the surface of the land, the ground water reservoir is cheated out of just that much supply. This ground water reservoir is very important. It is the source of a large amount of stream flow and well water. Ground water nourishes trees and other plants during dry seasons. In the summer, when the other sources of water have shrunk, the ground water reservoir continues to send

a regular supply to the streams. Like other reservoirs, the ground water reservoir is the great equalizer between the extremes of scarcity and floods.

## EROSION

Man can't control the basic character of the soil any more than he can control the slope of the land. Nevertheless, he can do a lot to control run-off. He can plow his fields in such a way that the furrows will hold the water. On badly eroding slopes he can plant close-growing crops, such as clover, which protect the surface of the soil with a thick sod. He can stop destroying the forests. He can plug gullies and put check dams in run-off ditches.

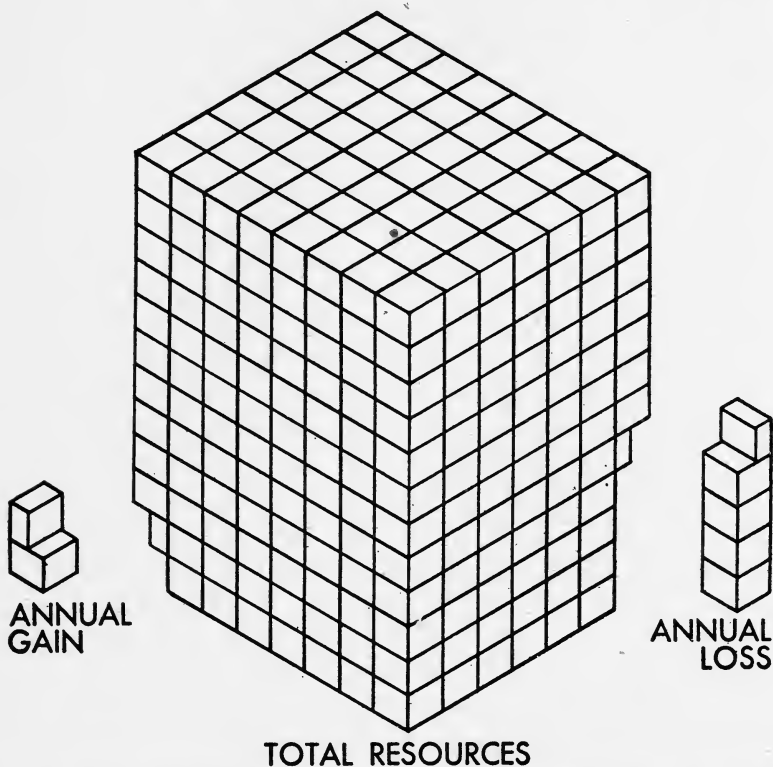
Anyone who has read the newspapers in the last four or five years knows why there is so much interest in run-off. Run-off is the key to water erosion, and water erosion has already destroyed 100 million acres of what was once productive farm land. Every year 400 million tons of soil are washed out of the Mississippi region alone.<sup>4</sup>

But that is just the beginning of the trouble that has come from this barrier that man has thrown across the absorption route of water. The soil that is carried from one field may be left on the field below. In that case the fine silt which has been washed down from above will choke the pores of earth where it is deposited. Thus the new land will have increased run-off and in turn it too will be eroded. Eventually, the final end of that silt will be some stream, and through that stream it will flow to some major river system and finally into the sea. Erosion debris is not always silt, however. Sometimes it is much coarser material, such as gravel, and even on rare occasions, boulders as big as small houses. Again, it may be a solid mass of fluid mud. In these cases, the results of erosion are just as destructive as a deposit of silt.

<sup>4</sup> Person, *op. cit.*, p. 2.

Anyone who has studied geology will say, "Very well, why get so excited about that? After all that process has been going

## THE YEARLY BALANCE OF CROP AND PASTURE SOILS



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on ever since there was water on the earth." Quite right. But geologic erosion in the United States accounts for the removal

of a mere fraction of eroded soil. Erosion from increased run-off caused by man accounts for the removal of 3 billion tons of earth a year. Most of this 3 billion tons is the rich topsoil that feeds plants. To see the point clearly, measure erosion in terms of plant foods in the soil rather than in terms of the soil itself. It is estimated that the plant food loss by avoidable erosion amounts to 126 million pounds a year. This is more than twenty-one times as much as is taken out by crops. To farmers this means an annual loss of at least 4 billion dollars.<sup>5</sup>

When the topsoil is gone, the fertility of the soil is gone because the underlying soil does not contain the chemicals and humus that make plants grow. The worst part of this is that under natural conditions topsoil is replaced at the rate of about one inch every 10,000 years.<sup>6</sup> It will take several times that many years to build up enough topsoil to make productive again land eroded to the sub-soil. This means that when the soil is gone, so far as we are concerned, it is gone forever.

#### THE EFFECT OF UNEVEN STREAM FLOW

Once silt, the product of erosion, gets into the bed of a stream, the occupants of a river valley should know that there is trouble brewing in the headwaters. The forests that protected the slopes of the mountains from which the river flows may have been cut. Perhaps the grass meadows which absorbed water for the underground source of the stream have been plowed up and lie fallow. In any case, this silt is a danger signal that run-off may be increased during the periods of high precipitation, or that there may be a scanty supply of water in the dry periods when water is needed most. The reason for this is that rain has run off the surface as soon as it has fallen, instead of sinking into the ground.

<sup>5</sup> *Saving Our Soil*, Public Affairs Pamphlets, No. 14, Public Affairs Committee, Incorporated, 1937, p. 2.

<sup>6</sup> Letter from Soil Conservation Service.

It may take several years for people who live along the rivers to realize what is happening. In any case, unless the run-off at the headwaters is checked, they are in for serious trouble. The nature of this trouble depends on the type of use to which the river water is put.

The users of river water can be divided into several groups. First there are those who depend on rivers for their domestic water supply. This means water for drinking and washing. About three-quarters of the population of the United States which is served by water systems depend on surface water.<sup>7</sup> When the stream bed fills with silt, it is more costly to clean the water. If the flow of water is uneven, coming down in floods in the wet season and shrinking to a trickle in dry periods, the water supply will be endangered. Floods overwhelm the water systems, frequently putting them out of commission. During the Ohio-Mississippi floods in 1938 many towns along those streams had to import water by railroad and truck because the water-supply plants were under water or washed out. In the dry season there may not be enough water. Also, when a stream flows slowly it does not carry off impurities such as sewage, so that the problem of purifying the water is increased.

Similar troubles afflict the industrial users of river water. They are unable to use the silt-laden flood water. The reduced flow of the dry season does not provide them with enough water for the manufacturing processes or for carrying away industrial waste.

Those who use river water to produce electric power find that their power dams are silted up in the flood season, if they are not completely washed away. In the dry season the water supply may be too small to turn the turbines.

During the periods of flood, river transportation must stop. Low water means that the channels may not be deep enough

<sup>7</sup> National Resources Board Report, *op. cit.*, p. 330.

for the boats. And in addition to that, the deposits of silt in the river-bed fill the channels with dangerous bars and shallows.

The fresh water of rivers and streams is the home of fish, which are a source of valuable food. But fish do not thrive in silt-laden flood waters. When the water is low it is even more difficult for them to survive. In normal conditions, an even-flowing stream will carry off a certain amount of natural silt, sewage, and industrial waste. Poisonous parts of this waste will be so diluted that they may be harmless. But when there is little water, these poisonous substances are so concentrated that the fish are killed.

Farmers who irrigate their lands with river water are most dependent on an even flow. Floods wash out their irrigation ditches and cover their fields with infertile silt and gravel. Low water during the hot dry growing season may be disastrous.

These are direct users of river water. The indirect users of this water are also harmed by the uneven flow of streams. These indirect users are concentrated primarily at the point at which fresh water meets the salt water of the ocean. The more fresh water that flows from a river into the sea, the more it pushes the salt water away from its mouth. This creates a sort of twilight zone in which there is a delicate balance between fresh and salt water. Shrimps, oysters, and lobsters, all valuable food, can exist only in the twilight zone. When the flow of streams is uneven, this balance is disturbed and the marine animals which depend on it are destroyed.

#### CONTROL OF WATER—FLOODS

None of these problems of water is new. Consequently, as they have become increasingly serious, men have tried to work out some system of control of water. It is quite natural that as the difficulty became pressing in one community, the people of the community tried to solve it in their own way. Thus most of the efforts to control water are attempts to escape the effects

rather than to cure the causes of the destructive power of uncontrolled waters. For example, the people of Portsmouth, Ohio, decided to build a great concrete dike around the city to protect them from the periodic floods of the Ohio river. Even if they had wanted to, it would have been impossible for them to attempt to cure the causes of these floods. No one could stop abnormal precipitation, and the citizens of Portsmouth had no more control over the deforestation and over-cultivation of sloping lands in the basin of the Ohio.

The solution of this flood problem must in part be to control, so far as they are controllable, the causes of excessive run-off. This is a bigger task than any local community can undertake. The other part of the solution is a unified engineering program for the whole river basin, which is also beyond the power of an individual community to undertake. The control of water, therefore, is a regional, not a local problem.

A map of the United States will show that each of the great river systems like the Colorado, the Connecticut, or the Mississippi flows through many states. The largest of these systems, the Mississippi, covers twenty-four states which contain about one-third of the total population and a little less than 41 per cent of the total land area of the United States.<sup>8</sup> The methods of land-use of the people at the headwaters of the Mississippi in Minnesota, or the Dakotas, or Pennsylvania are very important to the citizens of St. Louis and Vicksburg and New Orleans. Scores of millions of acres of denuded forests, of barren fields, of eroding hillsides in the vast basin of the Mississippi pour their quotas of racing rain water into the rivulets, brooks, creeks, and rivers that go to swell the mighty Mississippi floods.

In the West the problem of flood control is vastly different

<sup>8</sup> *Report of the Mississippi Valley Committee of the Public Works Administration*, October 1, 1934, United States Government Printing Office, Washington, 1934, p. 14.



from that in the East. In both sections of the country, however, excessive rainfall is the most powerful single force causing floods. Man cannot prevent excessive rainfall, but he can protect himself from the floods that come from cloudbursts by building levees and dams.

Another cause of overflowing streams in both the East and West is the destruction of ground cover at the headwaters of the streams. Man can do many things to remove this cause of floods.

But if the causes of floods are much the same all over the country, the kinds of floods differ greatly. Just how different they are you can see when you read this series of newspaper dispatches which describe a flood in Los Angeles in 1938.

"Los Angeles, March 2. Torrential rain drenched Southern California today with its worst flood conditions in twenty-four years.

"Six were known dead, while several others were reported killed and thousands marooned. Traffic was paralyzed. Schools were closed. Streets and highways were converted into torrents. There were scores of land slides. Houses were washed away.

"The Los Angeles River, ordinarily a dry bed, had a twenty-mile-an-hour current.

"Twelve thousand men working on flood control projects were mobilized by Army engineers and rushed to aid Red Cross officials, police, and firemen in evacuating flood-marooned thousands.

"Most flood control dams were full and overflowing. Many streets of Hollywood and Beverly Hills were fair sized rivers."<sup>9</sup>

"Los Angeles, March 3. Southern California's toll of dead and missing in the flood disaster reached 124 today as paralyzed Los Angeles struggled to restore public services and survey the full loss from a record-breaking storm.

<sup>9</sup> *New York Times*, March 3, 1938.

"The homeless were estimated at nearly 20,000 in the five affected counties—Los Angeles, Orange, Riverside, San Bernardino, and Ventura.

"All was silent in the Delta Land of the wildest river of the flood, the Santa Ana. The last ten miles of its drainage area, one of the most productive regions agriculturally in the United States, was a muddy lagoon."

"San Francisco, March 3. Graphic descriptions of inundated areas of residential districts and fertile farm lands in and around metropolitan Los Angeles were given here today by the pilot and passengers of the first plane in from Southern California in two days.

" 'There literally is water everywhere,' Roberts, the plane pilot, said. 'My own home is in North Hollywood, on the banks of a wash from Tujunga Dam. At five o'clock yesterday afternoon, the peak of the flood, there was twenty feet of water running over what normally is a bed of dust.

" 'The waters lapped at the side of my house. We had no electricity at times and our drinking water still was shut off when I left this morning. Yesterday when the river rose I saw three houses on the opposite side of the stream collapse and tumble into the flood.

" 'My wife and the neighbors had to put pans out to catch rain water for drinking and washing.' "<sup>10</sup>

"Los Angeles, March 4. Floods here are different from those in the Ohio and Mississippi Rivers where the waters rise slowly and steadily until the rivers overflow their banks or breach the levees. Here levees and dikes are almost useless for the water pours down the mountain sides so fast that no levees could hold it in check.

"Floods here come and go almost overnight, rising so rapidly that often the first warning is the roar of the water descending the mountain sides.

<sup>10</sup> *New York Times*, March 4, 1938.

"What prevented the disaster from being more serious than it was is the twelve reservoirs to the north of Los Angeles in the Sierra Madre mountains. These dams caught some of the water and held it back from the city, which lies on a sloping plateau. . . .

"It was estimated by engineers here tonight that the dams were holding back 100,000 acre feet of water from the city. One acre foot of water is sufficient to cover one acre of land to a depth of one foot."<sup>11</sup>

There is a play-by-play account of one flood that cost about \$60,000,000 and killed well over a hundred people. If you read the newspaper accounts carefully, you noticed that the dams built for flood control, although they were helpful, were unable to cope with the flood water. The storm that caused the flood was unusually heavy, but in climates such as that of southern California, there are many heavy storms. The question is why the flood control dams failed at that particular moment. The answer is that there was too much run-off. And why was there too much run-off? Chiefly because there was too much rain. But man could reduce the amount of destruction caused by such floods by better protection of the vegetation that covers the headwaters of rivers like the Los Angeles River and the Santa Ana River.

Some spring floods in the West start the previous fall as a fire. The fire burns the brush or chaparral which covers the mountainsides. When the spring storms come, there is nothing to hold the water back, so down it comes, burying whole sections in mud and rock, destroying buildings and fields, drowning people.

The people of Los Angeles are aware of the importance of keeping fire out of the chaparral. Los Angeles County maintains a large fire department whose sole duty is to watch for and put out mountain fires. The United States Forest Service

<sup>11</sup> *New York Times*, March 5, 1938.

controls large areas of mountain slope surrounding the Los Angeles region. These two agencies, with the help of Civilian Conservation Corps camps, are constantly looking out for fire.

So costly and difficult to control are these fires that the utmost effort must be made to prevent the start of one. An extensive system of lookouts is maintained over the area so that the first tell-tale column of smoke can be spotted. Motorists driving on the highways are forbidden to smoke during the dry season. Miles of fire breaks are cut through the brush. To a stranger, the mountains look as if some giant had taken his clippers and run them up and down the slopes in some kind of a huge joke.

The largest United States Forest Service experiment station is at San Dimas near Los Angeles, studying run-off and types of vegetation best suited to the area. This forest station is not concerned with trees. Its great interest is water and brush. Which kind of brush will grow most quickly on burned-over slopes? Which will thrive on the least water? Which is the most fire proof? These are the important question at San Dimas.

#### FEDERAL CONTROL OF FLOODS

Flood control has become a major job of the federal government. The greater portion of this work has been done in the Mississippi, Tennessee and Ohio Basins. The most extensive single flood control work is the Mississippi levee system. This was started in New Orleans in 1717, when a small levee was built to protect the city from floods. Since that time the levees have been extended up the river to Cairo at a cost of \$300,000,000.<sup>12</sup> Today it is clear that levees are not enough. Great spillways and flood reservoirs have been built along the river to take the surplus water during flood seasons. This work is being carried out by the Mississippi River Commission and supervised by Army engineers.

<sup>12</sup> Report of Mississippi Valley Committee, *op. cit.*, pp. 208-210.

These engineering projects of the federal government were largely concentrated on what is called downstream engineering. This is another way of saying that they were efforts to control the effects rather than the causes of excessive run-off. But as these effects became more severe people were forced to think about the cause. It took droughts, floods and a dust storm over Washington to make Congress really see that no matter what they had been doing to handle the water problem, it was not enough.

In 1928 Congress had passed the first inclusive flood control act. This law turned over to the War Department the task of laying out a system of dams, levees, and spillways to protect the people in the valleys of the main river systems. In spite of this program, floods, particularly in the Mississippi and Ohio valleys, reached new extremes of disaster. Finally, in 1936 Congress passed a flood control act which recognized that floods were not simply a problem of engineering. This act defined flood control as a problem of the entire watershed instead of simply main river channels.

The Flood Control Act of 1936 supplemented by the Flood Control Act of 1938 divided the work of controlling run-off between the War Department and the Department of Agriculture. To the War Department went the task of planning and building the great engineering works of downstream control. The Department of Agriculture undertook the problem of management of land to divert excessive run-off from the rivers to underground channels.

By this time soil erosion had become as popular a topic of newspaper articles as the endless fertility of the Great American West had been generations before. And along with this popular interest in soil erosion came the United States Soil Conservation Service, which was created in 1933. There are two ways to look at erosion. First you can think of it as a loss of soil. That is how

the rancher and farmer are apt to think of it. Another way to look at soil erosion is as a problem of wind and water. And when you narrow it down to a problem of water, you can say that it is a problem of controlling run-off. It is therefore logical that the Department of Agriculture assigned to the Soil Conservation Service the main part of its work under the Flood Control Acts.

#### HEADWATERS CONTROL

As we have seen, the three things that control run-off are slope, type of ground cover, and type of soil. The Soil Conservation Service attacked the problem from all three angles. In areas of steep slope where gullies had cut through the land, they built check dams to hold back the water. They planted the sides of the gullies with strong rooted plants so that the gully would have a protective cover. These dams and bushes were like a scab over a sore. As the earth began to be washed into the gullies and held there, the sore began to heal. The Soil Conservation Service concentrated on doing whatever could be done to keep the topsoil in place, to increase water absorption, and to check the speed of run-off. It built terraces to check run-off and put the water into the soil to nourish crops. It used strip-cropping to keep a part of the soil continuously covered with plants. It improved pastures and forest lands and planted trees to hold water and soil. The basis of its whole program was to control the speed of flowing water from the time the raindrop struck the earth until it reached a main stream channel.

Recently the government flood control program has been expanded to include the Connecticut, the Columbia, the Susquehanna, and the several other river systems that have become flood threats. In the New England states this program hit a snag because the people of these states believed that the taking over of land for flood control by the federal government without the consent of the states was a violation of state rights.

## DIVISION OF COSTS OF FLOOD CONTROL

Who should pay the cost of flood control in the Mississippi basin, for example? The people who are protected cannot afford to carry the whole cost. On the other hand, the taxpayers in the rest of the country receive no direct benefit from money spent on Mississippi flood control. The federal government takes the point of view that since the whole nation loses when one section is in difficulty, therefore the whole nation is benefited when aid is given to those sections which are in trouble. On the basis of that reasoning, the federal government has paid the largest part of the cost of flood control. The states and communities have borne only that share of the cost of lands and damages spent for purely local protection works. In addition to regular funds spent for flood control, much relief money has been spent to protect flood endangered areas by the Public Works Administration and the Civilian Conservation Corps.

The federal government flood control dam projects on the Tennessee River are the largest of their kind in the nation. Here the federal government is bearing all the cost. In Ohio the Muskingum Watershed Conservancy District is a local project for flood control. Its dams and reservoirs are concentrated in one state. However, this cost is also borne by the federal government under the flood control act of 1938.

## FEDERAL CONTROL OF NAVIGATION

The Constitution gave Congress power over interstate commerce, and Congress has assumed that navigable streams were an important factor in interstate commerce. This is one side of water use which from the outset was realized to be a regional rather than a local problem. Out of this power to regulate navigable waters has grown the power to regulate streams which affect navigable waters. On the grounds that the construction of dams to create electric power affects the navigability of streams,

the federal government has taken over the regulation of water-power sites. Furthermore, the Supreme Court has agreed that the government may generate electricity at flood control dams and sell that electricity. Since floods affect navigation, flood control projects are a part of the federal control of water.

To administer these various water-use activities the federal government has divided the work among various departments. The Coast and Geodetic Survey supervises the charting of harbors and coastal navigation, the War Department dredges the harbors, builds levees along rivers like the Mississippi. The Inland Waterways Corporation created by Congress in 1924 uses federal money to operate tugs and barges on the Mississippi, the Warrior-Tombigbee-Mobile Riverway, the Illinois River, and the Missouri River to transport goods.

Since the development of railroads, the inland waterways have become less important. It does not follow from this that the federal regulation of water has decreased. Quite the reverse is true. The federal government is increasing its activities to control floods and develop power.

#### POWER

The fact that water-power was a concern of the federal government was first clearly established when President Theodore Roosevelt withdrew from homestead entry the water-power sites on public lands. The federal government had had an indirect part in producing water-power when it permitted water users on federal reclamation projects to sell the electricity generated at the reclamation dams. Congress took a direct interest in power, however, when, stirred by the conservation policies of Theodore Roosevelt, it confirmed the President's closing of government-owned water power sites by passing a law preventing private individuals from taking up water-power sites on government land. Since that time government has gone a long way toward more complete control of power. In 1920,



some time after Congress withdrew from entry water-power sites on government land, it created the Federal Power Commission which took over control of water-power sites on all streams where power dams might affect the navigability of streams under federal control. Today the federal government is producing and selling electric power at Boulder Dam and in the Tennessee Valley. This sale of power will be increased when Grand Coulee and Bonneville Dams on the Columbia River are completed.

Many people think that flood control and power production can be accomplished by the same thing, a big dam. Unfortunately, this is only partially true. The first requirement of a power dam is that it have a full supply of water in it all the time. Flood control storage dams, on the other hand, should be empty as much of the time as possible so they will have room to accommodate the flood waters when they come. To have a successful power and flood control system combined, it is frequently necessary to have a series of alternating power and storage dams such as those in the Tennessee Valley.

The source of most of the streams in the East is in the mountain watersheds in either the Appalachians or the glaciated lake districts of Wisconsin and Minnesota. In most instances these watersheds were, or still are, covered with forests. A large percentage of this forest land is now either owned by the federal or state governments. This means that it is controlled by the state or federal Forest Services. To control the flow of water from these watersheds two things must be done. The trees must be protected from fire and disease. Where the forest has been cut, trees must be replanted. So far, no system of control beyond fire protection has been worked out for the remaining watershed forest land, although the federal government is considering means of establishing public regulation to prevent destructive over-cutting in these forests.

## SWAMP LAND

On the borderline between the East and West there is considerable swamp land. A part of this swamp area lies in Minnesota and Wisconsin. During the World War, when there was a great demand for new land, many of these swamps were drained. Drainage companies sent representatives to a swampy area. These representatives told glowing tales of huge profits made from drained swamps in other parts of the state. They said, "Now if you drain your swamps, you too will make equally fat profits." It was a pleasing prospect, and many farmers agreed to form a drainage district and hire the drainage company to drain the land.

Groups of farmers in an area were given permission by the state to issue bonds to pay for draining swamp land. Once the bonds were issued, the county guaranteed that the bonds would be paid.

The drainage companies collected their fees and moved on. The farmers were left with the land, some of it useless, a great deal more fertile enough; but when the war was over, there was a decreasing market to buy the crops grown on it. With no sale for their crops, the farmers could not pay back the money they had borrowed to do the draining. In some cases these drainage projects were successful, but in many others they were not.

Before it was drained this swamp land served two purposes. It was the home of many wild fowl and animals. At the same time it was a source of water supply for the streams running south. When the land was drained, the wild fowl had to leave. The streams were left without an adequate supply of water. And on top of all this, the land users had little more to show for their effort than a large debt.

The fate of that debt is a good illustration of the effect of taxation on land use. When the members of the drainage dis-

strict failed to pay their debt, the county was then faced with the necessity of finding the money to pay it. After all, they had guaranteed it. But the counties were depending on the increased production in the drained area to provide them with enough tax revenue to pay all of their debt. In many cases there was no such revenue forthcoming.

Some of the counties were now faced with bankruptcy. This would mean that all people to whom the county owed money would have to be satisfied with a small fraction of what they had lent. However, the chief creditor of the Minnesota counties was the State of Minnesota. If the counties went into bankruptcy, the county bonds owned by the state would be practically useless. People would be wary of lending the State of Minnesota money, since so much of Minnesota's money was invested in bad county bonds. Therefore, the state, in order to protect its credit, has paid the money owed by the counties for drainage. This has kept the counties from bankruptcy.

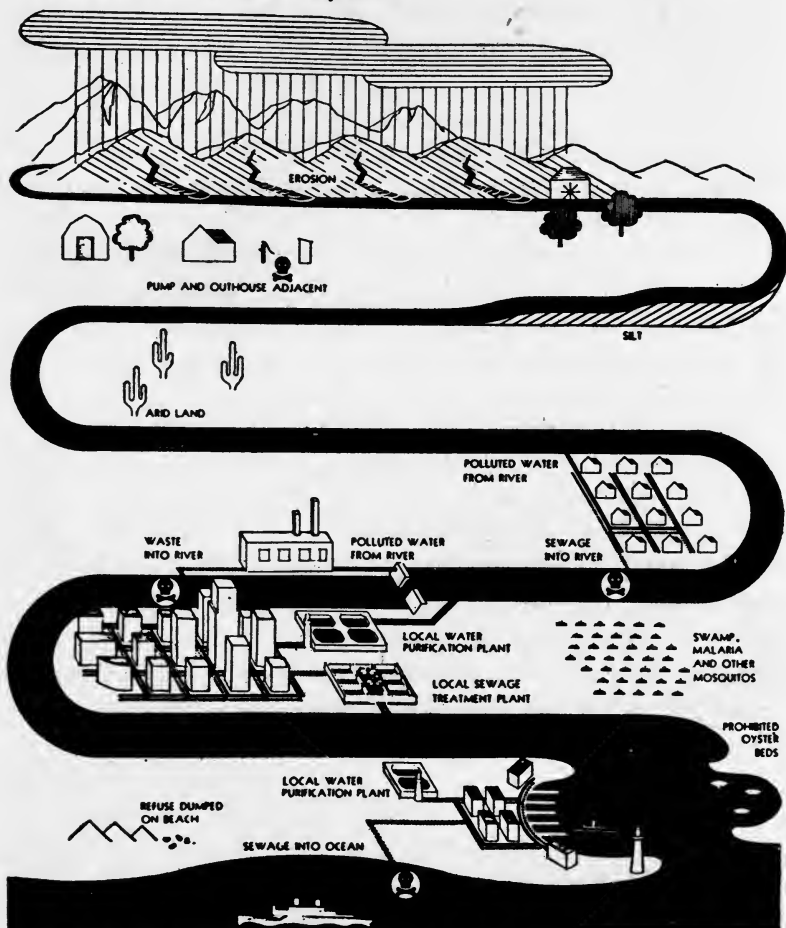
The result is that the Minnesota drainage projects have been paid for by all the taxpayers of Minnesota. A lot of these areas are now being returned to wild-life refuges; but when you remember that in order to acquire these sanctuaries, the taxpayers had to pay the cost first of draining them, and then the cost of filling them up again, you can see that this is a rather expensive aid to wild life.

#### THE ARID WEST

Between the hundredth meridian and the Cascade Range, the problems of water are the reverse of what they are in the humid East. The East is trying to find an efficient way of handling an abundant supply of rainfall. The arid West must find ways to distribute wisely a very limited supply of rainfall.

One of the chief supplies of water in the Middle West is the great Dakota artesian basin. This is a reservoir of underground water that has been stored in the porous sub-soils since the

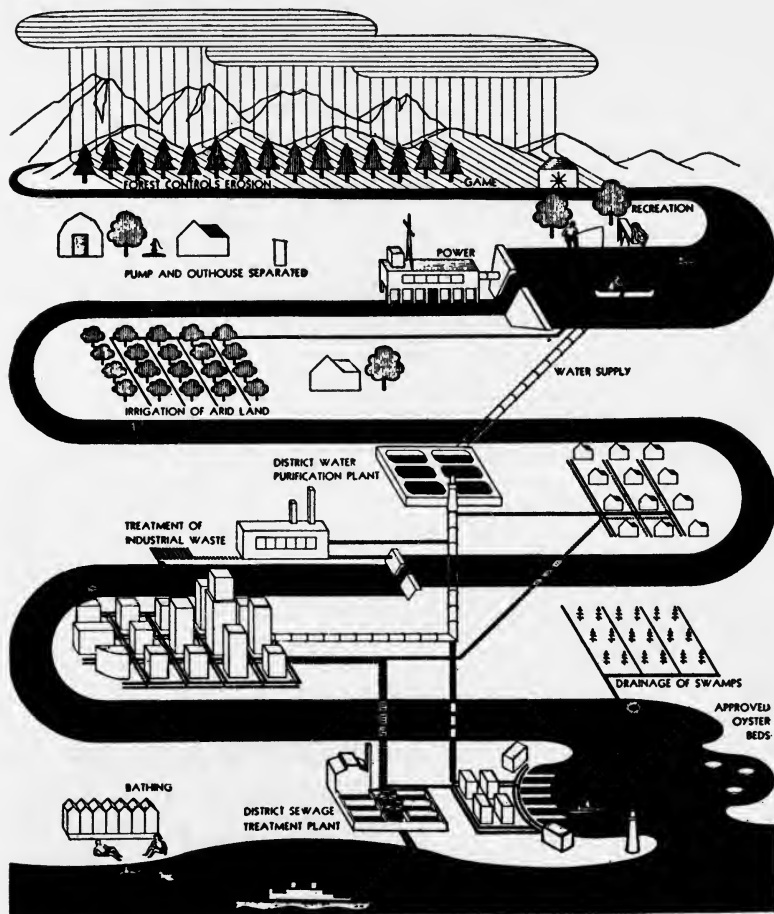
## Unplanned River Development



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*A watershed is a unit. If it is to serve its highest use to man, it must be treated as a unit. If the assets of a river are developed in a helter-skelter fashion a large share of them are wasted and the river becomes an instrument of destruction.*

## Planned River Development



PICTORIAL STATISTICS, INC.

On the other hand, if a watershed is developed as a unit, if each use of the water can be fitted into a central plan for the whole watershed, then the river becomes a rich resource. It will work for man and contribute to his wealth and security on the land.

time of the glaciers. A lot of the water of this basin is replenished by water entering rock in the Black Hills. These same rocks underlie the artesian basin. The farmers have drilled wells to get this underground water for their stock.

As you ride through this great, flat land you see dotted around the horizon the boxlike farmhouses, each with its windmill pump. And there are more windmills in the pastures where the stock is watered.

Today the drain on this Dakota basin is greater than the supply. In addition to the wells in use, much water is wasted by permitting little used wells to flow unchecked. To all of this, the recent droughts have added a further strain on the water supply. Most important of all the causes of this water shortage is poor land use. Too much plowing of the sod has increased evaporation and run-off of rain water so that more of it runs into streams and less into the underground basins. In some parts of North Dakota, for instance, the level of the ground water has sunk 30 feet within recent years.<sup>13</sup> In other states in this region the same thing is going on.

In the whole Great Plains country extending from the Canadian border, this ground water is an essential supply for stock, and in a very few cases, irrigation. Most of the states have done very little to protect the supply. New Mexico has a ground water act. This law declares, "The waters of underground streams, channels, artesian basins, reservoirs or lakes having ascertainable boundaries, are hereby declared to be public waters and to belong to the public and to be subject to appropriation for beneficial use." According to this law, the state engineer has control of the use of underground water. He can regulate the drilling for such water and govern the use of wells already drilled. If the users of this water have formed a conservancy district to develop and use the water for their

<sup>13</sup> Letter from Soil Conservation Service.

common good, the state engineer is given the power to enforce the regulations of the district.

Kansas approaches the underground water system in another way. Underground water can be restored if basins are built to catch rain water and let it filter to the underground reservoir. Also, this rain water will be available for irrigation and to water stock. To every farm on which a certain amount of rain water is retained, the State of Kansas returns \$40 of the state tax.<sup>14</sup> The main purpose of the Kansas law is to promote the saving of water for irrigation and stock. An added effect of this tax law, however, is to add to the ground water supply.

To aid the conservation of water in this region, the Soil Conservation Service has established demonstration areas to show methods of saving rain water by absorbing it instead of letting it all run into streams. This makes the flow of streams more even through the year and protects the underground reservoirs.

The latest federal aid to water conservation in the West is the Water Facilities Program. In the words of Congress, this program is "to assist in providing facilities for water storage and utilization in the arid and semi-arid areas of the United States." Like the headwaters Flood Control Act, the federal Water Facilities Program is under the administration of the Department of Agriculture.

Two existing bureaus in the Department of Agriculture, the Soil Conservation Service and the Farm Security Administration, were assigned to the job of carrying out this task. The Department of Agriculture was given \$5,000,000 with which to develop the water facilities program, and an additional \$5,000,000 was used in 1938 to rehabilitate farmers in arid areas. This rehabilitation took the form of improving the farmers' water facilities by helping him with loans, labor, and

<sup>14</sup> National Resources Board Report, *op. cit.*, p. 270.

machinery to build water facilities such as stock reservoirs and pumps. The Department of Agriculture also lends money to coöperative associations and individuals so that they can get these water improvements if they will agree to carry out sound farm management plans approved by the federal authorities. This law is primarily designed to develop small water facilities not large irrigation works such as those which are built by the Bureau of Reclamation.

The Water Facilities Act, although it limits the amount of government money to be spent on one project to \$50,000, does not prevent other interested agencies from contributing as much additional money as they think necessary. All these projects must be approved by the Water Facilities Board. The money spent for the improvement of water facilities on any private property must be supplied in part, at least, by the farmer. The Department of Agriculture coöperates only with those individuals or associations who develop the water facilities in a way that fits in with the unified plan of land use in that area. Any money lent to the land owner must be paid back over a period of twenty years.

One unique provision of the Water Facilities Act is the power it gives the federal government to refuse to provide money for the development of water unless the state or local governments pass laws protecting the water facilities developed under the act.

The Work Relief and the Public Works Act of 1938 gave the Secretary of Agriculture \$175,000,000 to lend to farmers in need so that they could make themselves secure by improving their land and equipment. The Farm Security Administration, which manages this program of farm rehabilitation, turned over \$5,000,000 of this for water conservation. This money was to be spent in such a way that it would help re-establish people by giving them water for their stock, for garden irrigation, and other necessary farm uses. Its primary ob-



jective was to enable people to get more out of the land. The emphasis in the Water Facilities Act was on better land use.

#### IRRIGATION

Irrigation is a many-sided problem. Most important is the question of who owns the water. The fact that the federal government at one time owned all the land of the western states, and in fact still owns about 680,000,000 acres of land, most of which is in the western states, makes this problem even more complicated.

There are two schools of thought about the ownership of water in the West. First there is what is called the California Doctrine. According to this, the government owned the water in the first place. When the states were admitted to the Union they were given political rights, but they were not given the federal property. Therefore, the federal government still owns the rivers. On the other hand, the followers of the Colorado Doctrine believe that the government gave up its right to the water when it admitted the states. The Supreme Court has not yet decided which of these doctrines is correct.<sup>15</sup>

But even if the states are eventually given control of the water within their borders, the water rights problem would not be solved. Since all great rivers, like the Rio Grande, the Arkansas, and the Colorado, flow through many states, someone must decide the water rights of the different states. Some believe that a state in which a river has its source has a right to all the water that flows within its boundaries. Other states say that the people who used the water first have a right to at least as much water as they originally used. Thus, if the original users consumed all the available water, no new users would be permitted. A third group holds to the theory that the water should be divided according to need. Thus, even

<sup>15</sup> *Ibid.*, p. 379.

though a water user may have been there first, another water user who needs the water for a better purpose has a better right to the water.

The difficulties at Boulder Dam are an example of just how complicated this problem may be. A compact was formed by the six states in the Colorado River Basin. This compact was an attempt to arrange for a just division of the water of Boulder Dam. Like other similar interstate compacts, it has been ratified by Congress. The states, however, have been unable to reach any decision about just how the water should be divided. In addition to this, the Colorado River is an international stream, and Mexico claims a certain portion of the water.

When the International Water Commission, the agency that handles problems of international streams, like the St. Lawrence, the Rio Grande, and the Colorado, tried to settle the problem, it found itself stumped by this fact. The various states argued that since the Colorado had all of its sources in the United States, Mexico had very little claim to the water. They proposed to give to Mexico enough water to cover 750,000 acres to the depth of one foot. Mexico considered this offer ridiculous, as they need from 3,480,000 to 4,500,000 acre feet a year to irrigate 1,500,000 acres of arid land.<sup>16</sup> According to another source, Mexico needs 3,357,000 acre feet; Los Angeles, 2,148,000 acre feet; Upper Basin, 9,593,000 acre feet; Lower Basin, 9,909,000 acre feet. This is 6,211,000 more acre feet than there are.<sup>17</sup>

There the problem rests. The states cannot agree on how much water each of them should get from the dam. To complicate the problem more, no one has decided who has the right to settle these problems. Those who believe in the Colorado Doctrine think that the states should settle it. The supporters of the California Doctrine think the federal government has

<sup>16</sup> National Resources Board Report, *op. cit.*, p. 382.

<sup>17</sup> Parkins and Whitaker, *op. cit.*, p. 298.

the right to settle it. In the past, at least, such cases have ended before the federal Supreme Court.

And if those legal problems do not make the securing of an adequate water supply for irrigation hard enough, there are, in addition to them, many even more complicated financial and technical problems.

Take the technical problems first. The primary technical problem is how to get enough water. "Very well," the engineers say, "we'll build a dam." "Just a minute," says the soil erosion expert, "you engineers said build a dam, when people wanted to irrigate the lower Rio Grande. You built it, too, Elephant Butte. And what happened? The country around the streams that fed it were so overgrazed that 18,000 acre feet of silt enter the dam every year, and long before it has paid for itself the project will be useless.<sup>18</sup> You should have called that one White Elephant Butte."

The soil chemist cuts off the engineer before he has a chance to reply to the erosion man. "Well, if you're going to irrigate, you have to lay plans to drain at the same time."

"What?" says the farmer. "Irrigate and drain at the same time? That sounds like nonsense."

"It may sound like nonsense," the soil chemist replies, "but it's a fact nevertheless. If you've ever been up around Santa Fe, you've seen that land covered with white alkali. That was deposited on the surface by irrigation water that wasn't properly drained. And that white alkali isn't half so bad as the black. Besides, you have to drain off the irrigation water that will run to the hollows."

And in addition to all these questions, someone will have to decide how evaporation from the irrigation ditches is to be reduced, how to control flood water, how to see that the trunk ditches and feeders are kept in repair.

<sup>18</sup> Van Hise and Havemeyer, *Conservation of Our National Resources*, The Macmillan Company, New York, 1937, p. 363.

The businessman who has been listening all the while asks a question. "Where is the money coming from?"

One suggests the federal government. "Let the Bureau of Reclamation do it," they say. Another thinks that a private company might be organized to bear the costs. It is finally decided to establish a conservancy district.

We will assume that this irrigation project is going to be built in New Mexico, and that the people who have been discussing it live in the town of Guadalajara. They and a group of fellow townsmen apply to the state legislature for the establishment of what is to be called the Guadalajara Conservancy District. The rules and plans for the district are drawn up. The people who live in the area to be included in the district are asked to vote on whether or not they want to have the district established. The merchants of Guadalajara are all for it. They reason this way: If we irrigate the land around here, that will bring in more farmers, and the more farmers there are, the more trade there will be for us. The small tax we will have to pay to meet the expenses of the district will easily be covered by our additional business.

When the farmers hear about the proposed district they are not so sure about it. After all, they have to bear most of the costs, and those costs are fairly high. The amount of water they will need for their crops will cost them about \$4 a year per acre. Besides that there will be a tax of \$2 an acre for every acre that can be irrigated whether it is to be used or not. This tax is to pay for the original cost of establishing the district and will continue for twenty years. All in all it means a cost of \$6 an acre a year, and where is that going to come from? "Why," say the townsmen, "from the added crops this irrigation system will enable you to grow." "And who'll buy these added crops?" the farmers ask. "We're already growing as much as you will buy from us." "Any businessman can see,"

the townspeople reply, "that there will be a big market for your additional crops in the rest of the country."

When the vote is counted it is discovered that a vast majority of the city people are for the conservancy district and an equally solid majority of the country people are against it. Since there are more city people, the bill is passed and the district is established.

Unfortunately for everyone concerned, it turns out that the farmers were right. No one will buy their surplus crops and they can't pay their water rent and taxes. To make matters worse, the costs were based on the belief that a certain number of acres could be irrigated by the project. Planners are always optimistic. But, as the ditches silt up and the river water is wasted in flash floods, it is soon found that the system will not supply that many acres. And even if it would, that would be little help since a number of the farmers refuse to use the irrigation water because of its high price.

The result of all of this is that the cost of water must be doubled. And the result of that is that hardly anyone can pay for it. Now three things can happen. The conservancy district can collapse. That would mean that all of those who lent money to start the district would lose it. The farmers could be forced off their land and their farms sold to others who might succeed. But the farmers are in no mood to be thrown off their farms, and besides, if the ones who know that land cannot farm it profitably, it is hardly possible that any outsiders would be successful. The third possibility is to borrow money from the federal government. This last plan is accepted. The Reconstruction Finance Corporation lends money to the Guadalajara Conservancy District on the condition that the costs are reduced. This means that those who lent money to start the district will lose some of their money, but not all of it.

However, this has not solved the problem. If the district is

to succeed, the farmers must have a market for their surplus crops. Today there is no such market.

You may say, that's just an imaginary situation. True, it may be imaginary so far as actual places are concerned, but there are several irrigation districts with just such a history. Altogether there are 20 million acres of irrigation projects in the United States.<sup>19</sup> Seven and six tenths of this acreage was financed by the United States Bureau of Reclamation, two-thirds of the number of the projects were financed by private capital and one-quarter were built on some plan similar to that of the imaginary Guadalajara Conservancy District.<sup>20</sup> Of the total irrigation projects, 172 have applied to the Reconstruction Finance Corporation for aid.<sup>21</sup> The usual cost of the projects has been from \$30 to \$160 per acre of land irrigated. The annual charges have amounted to an average of from 75 cents to \$2.50 an acre.<sup>22</sup> In order to enable the farmers to meet the costs of these districts, the Reconstruction Finance Corporation has forced the irrigation projects to reduce the charges to repay debts from \$43.70 an acre to about \$21 an acre on the average. In other words, those who put up the money with which to build these irrigation districts will get about 50 cents back for every dollar they lent.

At one time people believed that irrigation of land in the West was going to open up a whole new era of agricultural prosperity. In 1902, President Theodore Roosevelt signed the Newlands Bill which gave the federal government the power to build dams to provide water for irrigation and to sell this irrigated land to settlers. This has been called "the only public settlement activity prior to the World War."<sup>23</sup>

<sup>19</sup> *Report to The Secretary of the Interior by the Bureau of Reclamation*, United States Government Printing Office, Washington, 1937, pp. 28, 29.

<sup>20</sup> Letter from the Soil Conservation Service.

<sup>21</sup> Letter from Reconstruction Finance Corporation, August, 1938.

<sup>22</sup> *Ibid.*

<sup>23</sup> Parkins and Whitaker, *op. cit.*, p. 135.

The Bureau of Reclamation under the Department of the Interior was created to carry out this work. Since it was started, it has built 49 irrigation projects.<sup>24</sup> Three of these projects have been abandoned. Fifteen of them have been turned over to the organizations founded by the water users to govern the districts.<sup>25</sup> However, the government has kept its ownership of the dams and main ditches and the Bureau of Reclamation still manages them. Not counting Boulder Dam, the latest of the Reclamation projects, this program has cost the federal government \$227,437,000. This cost is about 175 per cent more than Reclamation engineers figured it would be. Since the cost of water on these programs must be borne by the land users, the farmers have had to pay much more than they anticipated when they took up this reclaimed land.

So far, these irrigation projects have not been wholly successful. The irrigated lands created by the Reclamation Bureau are but 7.6 per cent of the total irrigated land in the country,<sup>26</sup> and they are on the whole better off than many of the private and state irrigation projects. Reclaimed lands are not necessarily the answer to our land problems. There are very definite limits to the value of reclamation, and it is essential to recognize those limits.

Not all irrigation projects have failed. The Salt River irrigation project in Arizona, for instance, has been quite successful. There are many reasons for this. In the first place, the cost of water has been kept low, chiefly because the dam which supplies the water, Roosevelt Dam, also supplies electricity to surrounding communities. This sale of electricity has considerably reduced the cost of irrigation. In addition to this, the farmers have found a market for the products they grow in this area. Finally, most of the original settlers were good farmers who understood how to use the soil properly.

<sup>24</sup> Letter from Bureau of Reclamation, *op. cit.*

<sup>25</sup> Parkins and Whitaker, *op. cit.*, p. 136.

<sup>26</sup> *Ibid.*, p. 137.

Also on the good side of the reclaimed land ledger are the many successful drainage projects in the Lake states particularly. In addition to this, there are the large irrigation projects like Boulder Dam, Grand Coulee, and the All American Canal. These huge works of the Bureau of Reclamation are literally turning deserts into fields as fertile as Iowa bottom land. As more of our sub-marginal land is turned back into range and forest, these reclaimed areas will be ready to receive those who have been dispossessed by the dust storms and the gullies and the droughts.

In the end, whether or not reclamation is a good thing comes down to a matter of bookkeeping. Any project is profitable if the sum of the costs is less than the sum of the profits. The great problem in bookkeeping is what are true costs, and what profits should go to pay those costs?

It is expected that the Green Mountain Reservoir irrigation project will cost \$44,000,000. Suppose that because of bad markets or crop failures the people who use the water from this project are able to repay but \$43,000,000 over a period of twenty years. To an accountant this would mean that the Green Mountain Reservoir showed a loss of \$1,000,000. Now assume that this project provided irrigated land for 100 farm families from the dust bowl country to the east. Had these farmers remained on their wind-blown land they would have had to receive \$1,000,000 in relief funds during a twenty-year period. At the same time, the land of these farmers would within the twenty years be completely ruined if they remained on it. Assuming the very low value of \$10 an acre for this land, and also assuming that each farmer had 200 acres, this would be a loss of \$200,000. By providing a place for these farmers on the irrigated land, the losses of \$1,200,000 would be saved. If these savings were added to the profits of the reclamation project, it would not show a loss. The decision of whether or not reclamation projects are worth while depends



to a great extent on whether or not such a method of book-keeping should be accepted.

#### INTERSTATE CONTROL OF WATER

Although in the end water problems in various parts of the country are very like, they are often made up of individual difficulties of a wide variety. The East, for example, is a region of large cities. Large cities need vast amounts of water for both domestic and industrial uses. New York City uses 142 gallons of water for each inhabitant daily. This does not mean that 142 gallons is consumed by each New Yorker to drink, wash his dishes, and bathe. The figure of 142 gallons is a result of dividing the total amount of water consumed by the total number of inhabitants. Therefore, the 142 gallons includes the water used by industry and by the city for such purposes as flushing the streets and putting out fires.<sup>27</sup> Buffalo uses 324 gallons per day per citizen. Chicago uses 270 gallons per citizen per day. These figures are not very different from ancient Rome's 300 gallons per citizen per day, but with greater populations today, the total amount of water used daily by a city like New York has reached the huge total of 1,157 million gallons.<sup>28</sup> Even in the humid East that is a severe drain on water resources.

#### WATER FOR DRINKING

At one time there was a great gulf between the problems of city water supply in the East and in the West. With the eastern cities consuming more and more water, the gulf has shrunk to one major difference. This difference is the distance the larger western cities must go for their water. And as the eastern cities must reach out farther and farther for their water, even that difference is disappearing.

Water for Los Angeles comes chiefly from the Owens Valley, 238 miles from the city, and now Boulder Dam, 270 miles

<sup>27</sup> Parkins and Whitaker, *op. cit.*, p. 295.

<sup>28</sup> *Ibid.*, p. 301.

away. The Owens Valley was once a prosperous farming community of 7,000, dependent on water from the Owens River and deep wells for irrigation.<sup>29</sup> After a bitter struggle, the city has taken over all this water and the farmers have had to move on.

Today the Owens Valley is practically a desert. The direct cause of this desert is the consumption of the water by the city. The million and more inhabitants of Los Angeles need water. On the other hand, productive land is a basic resource of the nation. The question is whether the land is more important than the city. So far, the answer has been "no," but that answer is not necessarily the right one. A great many people have come to believe that the best future development of the United States would be toward decentralization. Decentralization would mean a shift of the population from a few large cities to a great many small cities.

In the arid West particularly, one of the most important factors influencing the growth of cities is the water supply. This water supply is controlled in most cases by the states. As the people of the state develop plans for distributing the water supply, they must also realize that they are deciding whether or not population is to be centered in the cities or whether it is to be scattered in the towns and in farming communities. They have to be able to balance these ideas. And in making that decision, they must realize that they are weighing the value of cities as opposed to the value of the land.

Boston recently decided that it was faced with a water shortage. It sent its engineers out to draft plans to draw water from the tributaries of the Connecticut River. When Connecticut heard of this, she protested. She claimed that she needed the Connecticut River water. Connecticut asked the United States Supreme Court to stop Boston's water project. The Court decided that Boston had a right to a fair share of water since its

<sup>29</sup> Parkins and Whitaker, *op. cit.*, pp. 294, 298.

need was greater than that of Connecticut. The most significant thing about that decision was this fact: the Supreme Court had decided in favor of Boston for a reason, greater need, which had up until then been applied to water problems only in the arid West.

Within individual states the making of plans for the use of water is a comparatively simple matter. It depends on whether or not the state legislature under the limitations of the state constitution wants to pass laws regulating the use of water. Such laws pave the way for community water control projects. In the South few states have such laws, while states like New York and Ohio regulate water very closely. In Ohio, for instance, the state permits various communities to create conservancy districts. The Miami Conservancy District of Dayton is an example of this. Dayton and other affected towns and counties, with state authorization, have taken over control of the Miami River. It has constructed dams to control floods and it has purchased and managed lands in the watershed to prevent the silting of these dams.

As we have seen, state plans alone cannot solve the main water problems. In an attempt to find a regional solution, some states have formed interstate agreements to control the use of water. One such agreement is the Ohio River Interstate Stream Conservation Agreement, which was drafted in 1924. The purpose of this agreement is to prevent pollution of interstate streams and promote their conservation. Ohio, Pennsylvania, and eight other states now have accepted this plan. This kind of agreement permits the various states to work out a joint plan, but it has no provisions to enforce the carrying out of the plan.<sup>30</sup> For that reason representatives of these states are working out an agreement which will provide for power to enforce the regulations.

A second type of state water planning is the interstate com-

<sup>30</sup> *National Resources Board Report, op. cit.*, p. 380.

pact. Such a compact must be accepted by the state legislatures and the federal Congress. One of the most important of these compacts was that drawn up by commissioners from New York, New Jersey, and Pennsylvania. Its purpose was to govern the use of the Delaware River. It was to establish a method for New York to draw water from the Delaware River for the New York City water supply without damaging the rights of the water users of the other states. The state legislatures would not accept the plan drawn up by the commissioners of the three states. After three years of controversy, during which time the water supply of New York City was getting dangerously low, the whole problem was handed to the federal Supreme Court to decide.

Another type of interstate control of streams is the creation of an Authority. For example, the problems of New York harbor concern both New York and New Jersey. The legislatures of these two states created a joint administrative agency, the New York and New Jersey Port Authority. This agency plans and pays for bridges, docks, and other similar projects and manages the harbor.<sup>31</sup>

Our use of water in America has, like our use of other natural resources, been determined wholly by need. We have never thought it necessary to limit our use to those things which are important to all of us and save the surplus for the future. It is only when we are faced with shortages that we realize how necessary careful planning is. Of that necessity there can be no surer sign than the decision of the Supreme Court on the water of the Connecticut. The fact that the laws of the arid West must be applied to the water of the humid East shows how the wise control of water has become imperative for America regardless of climate or rainfall.

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<sup>31</sup> *Loc. cit.*

## PROJECTS

1. Find out what local water-control projects there are in your area. Who pays for these projects?
2. Lay out a plan for the control of stream flow in some nearby river.
3. If you had to apportion the water of the Colorado River among water users, how should you do it and why?
4. Suppose you had to lay out an irrigation district. Assume that your whole class were people who would use the water and land. Draw up a plan to irrigate it.
5. Find out how the fish and waterfowl fare in your region. Are they protected? If they are, who protects them and how?
6. Make a map showing the most important stream in your county and all its tributaries within the county. How many square miles do they drain? If it rains 2 inches in 24 hours, how many gallons of rain will fall in this watershed?
7. After a heavy rain, find a small muddy stream. See if you can locate areas of bare land from which this mud is coming.

## DEBATES

1. Which is more just, the Colorado or the California Doctrine of water rights?
2. Is a city justified in taking away from a farming area its essential water resources, as Los Angeles took away the water of the Owens Valley?
3. Should the cost of flood and stream control be borne by the federal government, the state government, or the local governments, or a combination of these?

# THE GRASS LANDS

("The Last Longhorn," supposedly by Judge R. W. Hall, Amarillo, Texas)<sup>1</sup>

Just as trees make a forest, grass makes the range. So far as nature is concerned, the quality of the grass is controlled by the amount of water that reaches it. Where there is a comparatively high rainfall, say twenty-one inches, there are the tall grasses of the prairie plains. Here in summer the widely scattered eighteen and a half million acres of prairie that are left is a brilliant green sea of tall, waving grasses. Catlin writing of the rich bottom lands of the Missouri River between 1832 and 1839 told of "being obliged to follow the winding paths of the buffalo, for the grass was higher than the backs of our horses."<sup>2</sup>

<sup>2</sup> *The North American Indians*, Vol. II, London, 1880, p. 21.

As you go west from the land of the tall grass and cross the hundredth meridian you notice a great change in the grass. This is the country of the short buffalo grass and blue grama. In its original state, these vast plains were covered with a thick green sod. The grasses matured early in the season and turned to a rich brown as they cured on the stalk. Thus the herds of buffalo that lived on these ranges had a constant supply of forage.

The original cover of the short grass regions can be divided into three distinct types. Along the western edge of the short grass belt in Montana and Wyoming, the grass was mixed with sagebrush, wheatgrass and junegrass. Further south along the western edge of the short grass plains the grama was mixed with palatable herbaceous plants. Further south there were more buffalo and galleta grasses, along with woolly Indian-wheat, sixweeks fescue, rough pennyroyal and western stickseed, and a few perennial grasses such as needle-and-thread and sand dropseed. In the semi-desert and desert regions of the Southwest there were mostly shrubs like creosotebrush, sagebrush and saltbush and other plants which could resist long periods of drought. The natural meadows that lay between the western slopes of the Sierra Nevada and the Cascade ranges in what is now northern California, Oregon, and Washington were covered with the rich Pacific bunchgrass.

Originally the grass of the plains served two purposes. First, it protected the soil from the high winds that swept across the flat lands and the sudden rush of water which followed the infrequent but torrential rains. Secondly, it provided pasture for the buffalo, the elk, the deer, and the other animals that ranged this country. From the point of view of land use, grass played the most important role. It built up and protected the soil. It fed the animals.

The first European users of this range country, the Spanish, found the ranges of the dry Southwest not unlike the cattle lands of their native Spain. They settled along the slim green

margins of the few streams and let their long horned cattle graze the country around. However, these Spanish never brought in or raised enough cattle to make very much difference to the range so far as the amount or quality of the grass was concerned.

When in the early part of the nineteenth century the Americans became interested in the Louisiana Purchase, which they had bought from France, explorers like Lewis and Clark were sent out to investigate the plains region. Other explorers like Zebulon M. Pike cut south of the Louisiana Purchase line into what was then Mexico. Captain Pike was arrested by the Mexican government for trespassing, but he managed to get an account of what he saw to the officials at Washington.<sup>3</sup>

After traveling over the same country that Coronado in 1540 had called a "most wicked way,"<sup>4</sup> Pike wrote, "These vast plains of the western hemisphere may become in time as celebrated as the sandy deserts of Africa; for I saw in my route, in various places, tracts of many acres where the wind had thrown up the sand in all the fanciful forms of the ocean's rolling wave, and on which not a speck of vegetable matter existed."<sup>5</sup>

A generation later, Horace Greeley made a journey through this same part of the West, and he wrote back to the East, "I judge that the desert is steadily enlarging its borders and at the same time intensifying its barrenness."<sup>6</sup>

#### AMERICA DISCOVERS THE RANGE

It was accounts of the West like this, and particularly the Southwest, that started the belief in the Great American Desert. Indeed, many people thought that the whole region of the Great Plains, which runs west of the one hundredth meridian

<sup>3</sup> Faulkner, *op. cit.*, p. 216.

<sup>4</sup> *Old South Leaflets*, Vol. I, p. 5.

<sup>5</sup> Walter Prescott Webb, *The Great Plains*, p. 155.

<sup>6</sup> *Ibid.*, p. 159.



to the Pacific slope and north and south from Canada to Mexico, was a wasteland.

In 1879 the federal government sent Major Powell on an expedition to explore this country. It wanted to get a complete and accurate account of exactly what there was there and Major Powell turned in just such a report. Not only did he tell what he saw, but he laid out a plan of how that land might be used.

Essentially, his plan was to put into law the practices which had grown up with the early range users.<sup>7</sup> He realized that the plains region was primarily grazing land. The major task was to prevent the misuse of the grass.

According to Major Powell there were three important ways to prevent this misuse of grass. In the first place, he believed that the Homestead Act of 1862 gave too small an area of land. He argued, and wisely, that a man couldn't make a living on 160 acres in the range country. That might be enough in the East where there was plenty of rain. In the western regions, with less than twenty inches of annual rainfall, Powell figured that a man would need 2,560 acres if he was to raise a large enough crop to support himself and his family. And this crop would not be grains and intensively cultivated plants, such as were grown in the East, but cattle which would graze on the natural range. In addition to this, Major Powell thought each homesteader should have some area capable of being irrigated, so that he would be able to grow a large part of his own food and winter feed for his cattle when the ranges would not support them.

Powell's third idea was that the land should not be laid out in geometric squares, but in such a way that each settlement should have water for its stock and natural boundaries wherever possible. This division would put water within reach of all the people. His final proposal was that the ranch houses

<sup>7</sup> Parkins and Whitaker, *op. cit.*, p. 123.

should be grouped as much as possible, and the pasture lands, particularly those which were irrigated, should be owned and used in common.

Congress at that time flatly rejected Major Powell's proposals when they were presented in the form of legislation. The majority of congressmen came from east of the Mississippi, and the idea that a man would need 2,560 acres to make a living seemed to them ridiculous. A system of boundaries based on natural features seemed confusing. And as for the communal possession of pasture land, Congress rejected that as barefaced communism. It was useless for Major Powell to point out that such a communal system had been used by the Spanish Americans for years in New Mexico with considerable success.

#### THE CATTLE KINGDOM

Sometime before Major Powell made his report a cattle boom had started in the range country. In 1865, for instance, Texas cattle could be bought for from \$3 to \$4 a head. These same cattle could be sold for from \$30 to \$40 a head in northern markets. As Walter Prescott Webb put it in his book, *The Great Plains*, "It was easy for a Texan with a pencil and a piece of paper to 'figure up' a fortune. If he could buy five million cattle at \$4 and sell them in the north for \$40 each, his gross profit would amount to the sum of \$180,000,000 on an investment of \$20,000,000 plus the cost of transportation! This exercise in high finance is, of course, fanciful, but it does show what men did on a small scale. Five million cattle? No. Three thousand? Yes. Profit, \$108,000. . . . They [the Texans] took vigorous measures to connect the four-dollar cow with a forty-dollar market." Mr. Webb goes on to say that in fifteen years Texas sent more than 5,000,000 head of cattle to the North.<sup>8</sup>

<sup>8</sup> p. 216.

By 1880 the cattle kingdom was going full blast. There were several reasons for this. People in the East and in Germany, Scotland, and England had money to invest in the cattle industry. The railroads were able to carry the cattle to market. Colt's invention of the six-shooter had enabled the people who lived on the range to conquer the raiding parties of the Comanches, Apaches, and Navajos. There seemed to be plenty of free government land for grazing.<sup>9</sup>

The cattle industry had spread north and west from Texas over the Great Plains. Cowboys drove the great herds from summer to winter range, from range to the railroads at Dodge City or Abilene, Kansas, over the Chisholm Trail.

The whole structure of this industry depended on three things, the market for beef, grass, and water. The market, with few exceptions, held up fairly well until 1885. Grass everyone took for granted. Water was taken wherever you could get it.

It was the struggle for water that marked the beginning of the end of the cowboy period of range history. A rancher would settle along a river with the idea of providing water for his herd. As other ranchers moved in, the first rancher would claim more and more of the river in order to protect his water supply. With the invention of barbed wire, the rancher had for the first time a cheap fencing material. This meant that he could fence off a piece of land along the river for himself. The Homestead Act then allowed him 160 acres. But there was nothing in the law to prevent a rancher from having each of his cowhands claim a homestead of 160 acres and turn it over to his employer.

Thus each rancher scrambled for the river and creek shores and the water holes. As the sheepmen and more cattle ranchers began to move in, the older ranchers fenced in land whether or not they had any claim to it. Soon it became a race to see who could fence in the most government land. In Colorado two

<sup>9</sup> Webb, *op. cit.*, p. 234.

companies took in about 1,000,000 acres apiece of government land. They had no more right to fence this land than they would have had to string barbed wire around Capitol Park in Washington. During this period thirty-two cases were reported to the General Land Office involving the fencing in of 4,431,000 acres of government range lands. When the officials of the Land Office, who were responsible for administering government land, objected to this, one of the ranchers asked, "Are you Land Office men going to get out of here and leave us alone, or will we have to settle this with our Sharp 45's?"<sup>10</sup>

The Land Office men took neither of these suggestions. Instead they managed to bring the offenders into court, and by 1890 they forced them to give up this illegally fenced land. One historian calls these land grabs the worst in the history of the United States government lands. But the cause of these grabs was something more than greed.

#### THE SCRAMBLE FOR WATER AND GRASS

In the first place, so long as there was enough free range, the cattlemen needed to own only the land around water for their stock. And with this taking up of land around water grew up a tradition regarding the use of water which was quite different from that of the East. Property laws in the humid regions naturally did not take into account the problems of an arid region. Consequently, the law of the East was that water was common property which no one could take control of for himself alone.

In the arid West, a rancher had to own his water supply. With water very scarce, he could not take a chance that another rancher would drive a herd to his water hole and leave it dry. Consequently, the tradition grew up that a man who owned both banks of a water course, owned the water and could use it as he pleased. This was the old Spanish law

<sup>10</sup> Hibbard, *op. cit.*, p. 477.

which had grown up in Spain, another country in which water was scarce, and transplanted to the American Southwest by the Spanish cattle raisers.

The effect of this tradition was that as more people came into the country, the ranchers who were already there hastened by one way or another, fair or foul, to get control of all the land supplied with water. But control of the water was not enough. The great herds of beef cattle began to destroy the grass. And when the grass had been grazed to the point where it would no longer support cattle, several years were necessary before it was in condition to be again grazed. In the arid West the grass recuperates slowly.

To add to this problem, sheep herders came into the range country. Unlike cattle, sheep bite off the grass just above the ground. Thus on overgrazed ranges the strain on the grass was increased with the coming of the sheep. In addition to this, once sheep had grazed the already poor ranges, cattle could not find enough left to support them. Sheep, on the other hand, could find enough feed on ranges left by cattle because the cattle did not crop the grass so closely.

The cattlemen decided that since they were the first to occupy the range, they had a right to it. They attempted to drive the sheep herders away. The sheep herders, on the other hand, believed that they had as much right to the range as anyone else, since the land belonged to the government. Thus began a long bitter war in which sheep, cattle, and sometimes men were killed.

While this battle was raging, another group of land users began to come on the range. These were the dry farmers. The railroads which had been given large areas of government lands in the range area decided that to sell this land it would be necessary to destroy the idea of the Great American Desert. Their agents advertised this range land as the most fertile in the world. A pamphlet called "Star of Empire" published by

the land company of the Kansas Pacific and Denver Pacific Railroads said of the arid land that it was "unimpoverished by abundant rainfall." Since twenty inches of rain a year was a wet year in the range country, this was making the best of a bad bargain, to say the least. A gentleman named Smythe published in 1907 a book called *The Conquest of Arid America* in which there was a chapter entitled "The Blessing of Aridity." He referred to the arid regions as "the better half of the United States."<sup>11</sup>

Along with this propaganda went current beliefs that rain-fall followed the plow—that is, that when land was plowed more rain fell to nourish it. Unfortunately, about the time people began moving into the arid country to farm it, there was a series of unusually wet years, with the result that when the usual dry season returned, the farmers thought that it was a severe drought. They had put their money and their time into the land, and they refused to believe that they had made a mistake. Unhappily for them, the drought continued. After a few years, the tide of dry farmers or "nesters," as they were called in the West, began to retreat. From 1910-1929, 50,000,000 acres were taken up by dry farmers—mostly in 1915.<sup>12</sup> This was the period immediately after the wide development of farm machinery which made cultivation of large areas easy. In fifteen representative dry-farming counties in six states from 4 to 40 per cent of the population left the land between 1920 and 1930.<sup>13</sup>

#### THE DESTRUCTION OF THE RANGE

In their wake the dry farmers have left the broken plains, fields unprotected by the grass cover, bare earth which blows across the flat land in great dust clouds, choking out the grass

<sup>11</sup> Parkins and Whitaker, *op. cit.*, p. 131.

<sup>12</sup> *Western Range*, United States Government Printing Office, p. 130.

<sup>13</sup> *Ibid.*, p. 22.

in nearby areas, spreading over the face of the plains like a shroud.

Thus, along with the overgrazing of cattle and sheep which destroyed the grass, was the dry farmer who tore up the sod and left drifts of dust in his wake. And as the grass cover was destroyed, insect pests like the grasshopper seemed to increase, eating the crops of the remaining dry farmers and taxing the grass even more.

In 1911 the enlarged Homestead Act was passed. This permitted a settler to take 320 acres. Then in 1916 came another Homestead Act giving the settlers the right to 640 acres of land. This was called the Stock Raising Homestead Act.<sup>14</sup> Congress had at last realized that the original grant of 160 acres was too small in the arid regions. But this act came too late. Even if it had come earlier, it is doubtful if it would have provided enough of the good land for profitable grazing. As it was, a large portion of the good land was taken up or destroyed, and 640 acres of bad land was of little use to anyone. One homesteader expressed his feelings about it in this song:

Hurrah for Greer County! the land of the free,  
The land of the bedbug, grasshopper and flea;  
I'll sing of its praises and tell of its fame,  
While starving to death on my government claim.

(From "Tom Hight's Scrapbook," Oklahoma City, Okla., 1909.)<sup>15</sup>

It has frequently been said that one of the chief causes of failure in land use is a lack of knowledge of how to work with the soil. If there is one part of the United States where this statement fits best, that part is the plains country. One reason the farmers and ranchers have not understood how to use this land is the fact that all their knowledge of land use had been

<sup>14</sup> Parkins and Whitaker, *op. cit.*, p. 125.

<sup>15</sup> John A. and Alan Lomax, *Cowboy Songs*, The Macmillan Company, New York, 1938, p. 407.

acquired in humid regions. It was not until the late nineteenth century that the great grasslands of the world were used extensively. And everywhere they have been used, in Africa, on the steppes of Russia, on the pampas of the Argentine, and in the western part of the United States, there has been the same destruction of the grass and the soil.

This destruction of the range lands, along with the agricultural depression that followed the World War, and then the industrial depression that followed that, brought great hardship to the land users of the West. Like the farmers elsewhere in the country, they had an insufficient market for their products. They had no money with which to pay their debts, and like the other farmers, their debts were very high because of the fact that they, too, had bought land, machinery, and stock during the boom in agriculture during the World War.

#### THE OWNERS OF THE RANGE

The problem of the range country must be looked at this way. The basic resource is grass. The question is how to save the grass and at the same time make the land support as many families as possible. Much of the land which the sheep herders and cattle ranchers depended on for feed is owned by the federal government. The Department of the Interior controls 270 million acres which is listed as Public Land.<sup>16</sup> Until the passage of the Taylor Grazing Act in 1934, the stock owners were allowed to turn their animals on to this land without restriction. The United States Forest Service in the Department of Agriculture controls another 82,500,000 acres of range land.<sup>17</sup> This also is available to stockmen for grazing under careful regulation.

In addition to the federal land there is also a large area of

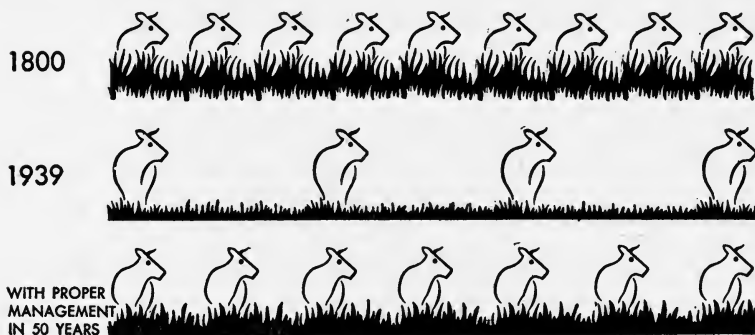
<sup>16</sup> Letter from A. E. Donham, Acting Ass't Commissioner General Land Office, August, 1938.

<sup>17</sup> *Western Range*, p. 34.



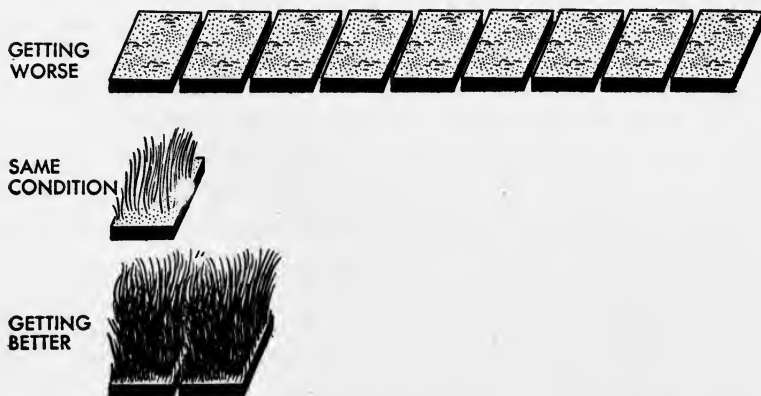
# RANGE LAND IN THE UNITED STATES

## CARRYING CAPACITY



Each symbol represents 2.5 million animal units

## CONDITIONS TODAY



Each symbol represents 60 million acres

PICTORIAL STATISTICS, INC.

Overgrazing is the chief cause of the failure of the range to support a profitable live-stock industry. Land that once had enough grass to feed twenty-two and a half million animals will today support but ten million animals. And for every sixty million acres of range land that is improving there are one hundred and fifty million acres of land growing poorer.

land still owned by the railroads. This is the remainder of the land given to them by the federal government and state governments to help pay for the costs of construction. The states themselves also own range land. They have acquired this land either from the federal government or from private owners who have been unable to pay the taxes on land taken as a homestead or purchased.

The Department of Interior land is usually low land. This means that in summer the land is not serviceable for grazing. Western grass in the warm range country goes through a rest period during the hot months. As range, this land is best during winter and spring and is called winter range. The Forest Service land, on the other hand, is high, in or near the forests which grow on the mountain slopes. This range is best in late spring, summer, and early fall. This is the summer range.

The stockmen drive their animals from winter to summer ranges as the seasons progress and use land of their own to grow feed for winter feeding or fill in the gaps between periods when the grass is unfit on government areas.

The important thing is that the stockmen cannot exist without the range land provided by the government. The homestead laws did not give enough free land in the first place. The impoverished range land of today will support so few cattle that if a rancher were to own enough land to graze all of the cattle he needs to make a living, he would have to own perhaps several thousand acres of land, and have besides land capable of growing hay and similar winter feed. Just how poor some of this land is can be seen from the fact that in some areas it takes 200 acres to grow enough feed for one cow for one year. On the average, the virgin range could support between two and three times as many cattle as the range in its present depleted state.

#### PROBLEMS OF RANGE OWNERSHIP

In order to solve the problem of grass, the problem of controlling the use of range land must first be solved. In theory the

owners of the land can control the amount of grazing on that land, and by controlling the grazing on the land, the grass can be protected. But if the ownership of land is too mixed up, this control is hard to put into effect.

In practice, this is how the problem grows. A rancher has 150 head of cattle. He owns 640 acres of land; part of this he homesteaded, and the rest he bought during the war at high prices and on borrowed money. He is still paying the interest on this debt. Since his homesteaded land is near water, he irrigates a small portion to grow alfalfa hay to feed his stock during the winter months. He also has a garden to provide food for his family. Adjoining his land is a large area of public domain which is heavily grazed by all the surrounding ranchers. Our rancher finds enough grass here for his herd during March and April. When this feed is gone, he shifts his herd to Forest Service land and keeps them there until August. In August he rents land from the railroad or the state which lasts until December, when he brings them back to his own land where there is grass for grazing and hay which has been cut and cured.

Now if the Forest Service or the Department of the Interior or the railroads or the state should decide that their land is overgrazed, and limit the number of stock the rancher could put on their land, the rancher would either have to find land elsewhere or cut his herd. To find grazing land elsewhere is difficult, because the National Forests are fully grazed and the public domain is overgrazed. To buy private land means increased debt and taxes. So, in general, the solution of the range problem means cutting down herds, especially those of large owners. But this does not necessarily mean less profits. In fact, good grass and better handling of herds eliminates losses by starvation, produces fatter and higher grade stock, and increases the percentage of the calf crop and the lamb crop. Here, as in other kinds of land use, the only kind of use that pays in the long run is good use, because bad use destroys the land, the plants, and the industries depending on them.

## THE STATES AND THE RANGE

So far as most state governments were concerned, their reaction to the range problem was to ignore it. The states had acquired range land by three methods. First, they were given land by the federal government to sell in order to pay for schools, agricultural colleges, and roads. Later, on the insistence of the states, they were given other land which the federal government saw little chance to dispose of as homesteads. This was done by the Desert and Swamp Land Acts, giving supposedly desert and swamp land to the states. In many cases the land taken by the states under these acts was neither desert nor swamp. The final method by which the states acquired land was through tax delinquency.

This is how land becomes tax delinquent. A man buys land. He is unable to pay the taxes on it. In many states after a certain period of time (usually about seven years) the state or county takes over the land with the threat to sell it at some future date. The original owner, however, usually has the right for several more years to buy it from the state or county at the cost of the unpaid or delinquent taxes. After this period has elapsed, the state or county offers the land for sale.

In the range country, tax-delinquent land usually is turned over to the county. During the period when the land is delinquent, but unsold, this land is administered by the county. The usual thing for the county to do is to try to rent it for grazing. The county does not care how the land is grazed so long as it brings in some revenue. Many range states, when they acquired tax-delinquent lands, felt about it much the same as the counties. In some cases, the delinquent land was rented to the non-taxpaying owner.

However the states acquired range land, they made little or no effort to take care of it. They simply leased it and let the tenant use it as he would. And many of the tenant-grazers

misused these lands as badly as tenant farmers misused farm lands in the East, and for the same reasons—they had no permanent stake in the land and got as much out of it as they could while the getting was good.

#### THE GENERAL LAND OFFICE AND THE RANGE

The state and county governments were no worse than the General Land Office of the Department of the Interior so far as the destruction of the range was concerned. The Land Office thought of itself as a department whose sole purpose was to get rid of land. Indeed, that had been its chief purpose since it was founded. Whether or not the land was overgrazed did not concern the Land Office, since protection of the grass was not part of the duty assigned to it by Congress. The Land Office was supposed to stop trespassers, but trespassing on government land had become almost a custom and the Land Office did very little about it. The recent federal law to control grazing on the public domain originated, not in the General Land Office, but through years of pressure by the Forest Service and the Department of Agriculture and through the personal interest of the Secretary of the Interior.

Everyone knows the result of this policy of grass destruction. Dry farmers had to give up the land they tried to turn into homesteads with hope and sweat. Ranchers lost their stock and were forced out of business. Counties and states were loaded with tax-delinquent lands. Banks which had lent money to ranchers failed. And all the time grass, the basic resource of the Great Plains, was being destroyed by overgrazing.

The effects of this destruction were not restricted to only those who used the range.

#### EFFECT OF RANGE DESTRUCTION ON WATERSHEDS

Salt Lake City lies in the crooked arm of the Wasatch Range of mountains that lie to the east and north. In 1846 Brigham

Young led the Mormons through the passes of the Wasatch. He stopped before the great plain which surrounds the Great Salt Lake, and announced, "This is the place."

The desert was not exactly a garden spot, but by wise use of irrigation in the flat land, the Mormons soon made it into one. They had learned to manage their land wisely in New York and Ohio and Illinois. But although they understood the use of valley land, they were not equally wise about the use of the hillsides where they grazed cattle and sheep.

With overgrazing much of the original perennial cover of the soil was killed. Then, when the torrential rains of summer lashed against the sides of the Wasatch, the water ran off in floods. It concentrated in the narrow canyons between the ribs of the mountains, gouging and cutting away the sides of the canyon and depositing everything from fine silt to huge boulders on the fields of the farmers below.

Farmington is another Mormon settlement in northern New Mexico. It is a sleepy little town shaded with great cottonwood trees and Lombardy poplars which the Mormons always planted on their homesteads. The neat brick houses that line the wide street could well have been in a New York or Illinois town. For water to irrigate their fields the people of Farmington depend on the San Juan River which flows into the Colorado.

The San Juan flows through range country. On its south bank lie the huge Navajo and Hopi Indian Reservations. The old traders will tell you that when they first came to that country a quarter of a century ago they used to drive their wagons from Gallup to Farmington through grass that scraped the bellies of their horses. Today you can drive that hundred and twenty miles from Gallup to Farmington and see range with grass so short it would hardly scrape the belly of a caterpillar. And your trip will not be made any more pleasant

because of the sudden dips the road takes into the great ditches or arroyos which have been cut into the overgrazed range by the raging torrents that follow the infrequent rains.

Where has this soil gone that was washed out of these arroyos? Into the San Juan River, silting up the channel, ruining the irrigation ditches of Farmington, flowing down into the Colorado and now beginning to silt up Lake Mead behind Boulder Dam.

A few miles east of the road that runs from Gallup to Farmington is the divide which separates the Colorado drainage from the Rio Grande. The Rio Grande range has been overgrazed for years. The soil of the range is melting away like a loaf of sugar in the bottom of a teacup. As a result the lower Rio Grande and the irrigation systems supplied by the Rio Grande have been seriously damaged. Dangerous floods threaten the land and people of the valley.

As you drive through that country you will see mile after mile of range 200 acres of which would barely support one cow for one year. You will bump over washed-out roads beside river beds filled with silt and boulders and lined with crumbling vertical banks that are farther eaten away after each rain. Occasionally you will come on a straggling farm community.

Part of this washing and cutting through of the soil is a geological process. The streams have not yet carved out their permanent channels, the soil and rock have not yet been deposited in their permanent resting place. In a state of nature undisturbed by man, shifting of soil and water is a slow, almost imperceptible process and it is usually accomplished without any disturbance of the natural balance of soil, plants, and animals. It may be called natural erosion. But man has got into difficulty because he has greatly accelerated and intensified this slow natural erosion. And where geological forces would have taken thousands of years to do the job of moving the soil of

the range, man has speeded up the process. In half a century he has created artificial types of erosion such as gullying and wind erosion which were very rare when the range belonged to the Indian and the buffalo. The blame for the destruction of the range must be laid to the white man and his civilization.

#### THE COLLAPSE OF RANGE ECONOMY

In 1934 there was a collision of the three most powerful forces that controlled the use of the range. These were drought, economic depression, and man-made erosion. The result was disaster: no crops, no money, wasting land, and a stranded population.

For the dry farmer, retreating since 1920, there was practically no help. Various federal agencies created to make it easier for those who depended on agriculture had helped the rancher somewhat. But by the time this help was ready, many of the ranchers had already gotten hopelessly in debt. The age-old solution, which has always been proposed to solve agricultural problems before—give up the land and move west—was useless. There wasn't any more West to go to as free settlers. For the dispossessed farmer today pioneering in the West has simmered down to a miserable existence in the migratory farm labor camps in California and the Southwest.

Here was a problem too big for individual farm land users to solve. It was necessary for government to step in. One of the first governmental agencies to heed the call of the range users was the state government of Montana, and with good reason. Not only were the range farmers and ranchers in distress; Montana was the only state in the Union which had in 1930 a smaller population than it had had in 1920. Statistics may often be meaningless, but there was a statistic that believers in the "go west" theory could well consider.



## STATE SOLUTION OF RANGE PROBLEMS

Montana attacked the range problem from the land ownership angle. If you should draw a map of land ownership in any typical range county, the result would be a patchwork quilt. Here would be a small area owned by some out-of-state cattle corporation, or a lending agency that had taken over a local cattle outfit. To the north of this piece would be a square of railroad land. Next to that would be some public domain land with possibly some state school land in the middle of it. Probably there would be nearby a National Forest through which would be scattered little areas of private land, state land, railroad land. And everywhere would be sections of tax-delinquent land. In this helter-skelter pattern of ownership the individual livestock grower was caught in a maze of legal and bureaucratic technicalities. Montana's solution was to authorize the stockmen to form grazing districts. The law making this possible was passed in 1933 and amended in 1935.

This is how a grazing district operates. Three or more land users in an area sign a document called Articles of Incorporation and file it with Montana's Secretary of State. This document declares that the signers have formed a coöperative grazing association for "the acquisition, control, conservation, and beneficial use by its members of certain grazing lands lying in . . . County." They agree to buy or lease land adjacent to the land they own so that they will control a solid block of grazing land. Then the members by a majority vote elect a board of directors and decide on a form of government for their grazing district.

These decisions must be approved by the Montana Grazing Commission. The directors apportion the land among the members and determine how much stock they may graze on it. They lay down rules of how this land is to be used. These rules must be approved by the Montana Grazing Commission. In order

to meet the costs of buying and leasing land for the district, the members must pay a fee for the land they use. If there is more land in the district than the members need, the directors may lease it to non-members.

If a member of a district objects to the rules, he may appeal to the Grazing Commission, and if he is dissatisfied with that decision he may take his case to the regular law courts. The decision of the Montana Supreme Court is final.

This law provides that the grazing districts must coöperate with the government agencies which are trying to control land use. Like the rural zoning law of Wisconsin, and the Soil Conservation District law, the Montana law is effective only if the land users in a given area decide to use it. In other words, the federal or state government does not impose a law. It paves the way for the people of each area to make a set of laws to meet their own problems. The only power retained by the state and federal governments is the right to coöperate with and supervise certain conservation work in that area.

It remains to be seen whether this system of permitting groups of individuals to take over a certain amount of control of land use will be sufficient to make the range again a truly productive resource. To achieve good land use many difficult technical problems must be solved. Many of these problems are not understood by some of the people who use the land. Frequently, the solution of such problems requires more money than an individual can afford to pay.

The question is, will or can an individual landowner solve these technical problems alone, or must government agencies step in at some point and demand that certain land-use practices be followed? This is a basic problem in the question of conservation of natural resources. It is also a basic problem in democratic government since it is really a question of the rights of individuals versus the rights of society.

## FEDERAL CONTROL OF RANGE LAND

With the grass of the range already weakened by years of overgrazing, and more and more of what was once farm land abandoned to the "black blizzards" of dust, the droughts of 1934 and 1936 came like the final blows to overthrow the tottering range economy. Individuals were helpless. What the people needed was immediate help, and the only agency that was organized to give help was the federal government.

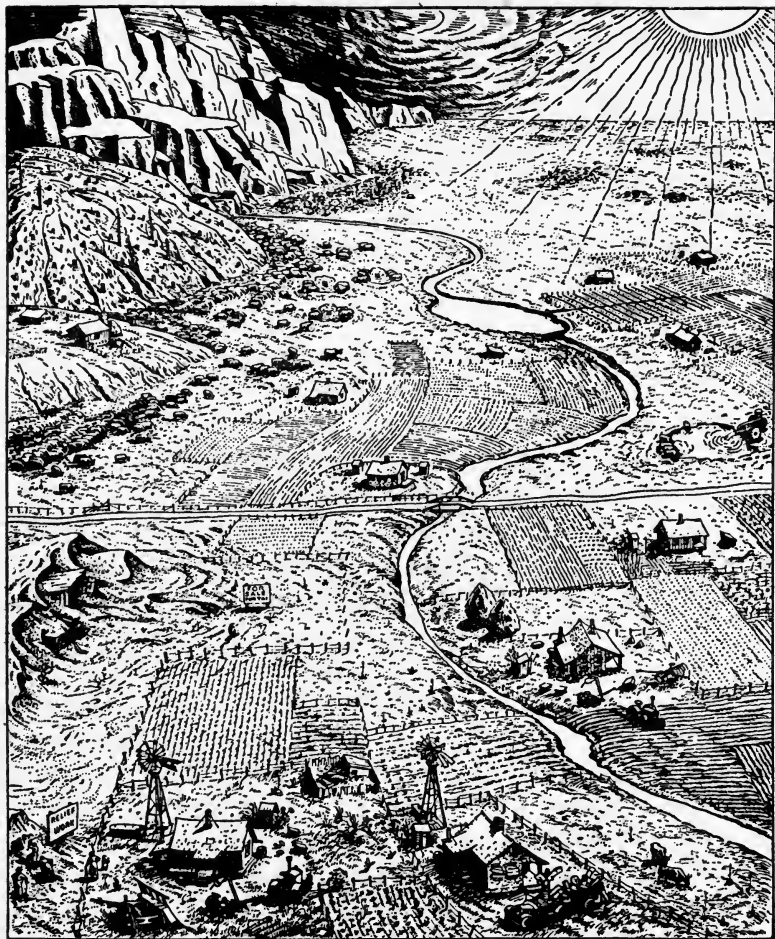
Grass and water for livestock shriveled and vanished under the blistering, endless sunshine of the summer of 1934, and again in 1936. In the latter year, after the water supply and grass had been weakened by the previous drought, the dry spell was even longer and more severe. The cloudless sky of the range country rang with the bellowing of thirsty cattle.

To help the drought-stricken areas, the Surplus Commodities Corporation, a federal agency, bought the thirsting stock and moved it to the humid East, or slaughtered it. Relief agencies provided money for starving ranch families. Federal agencies lent money to tide the ranchers over until a better year.

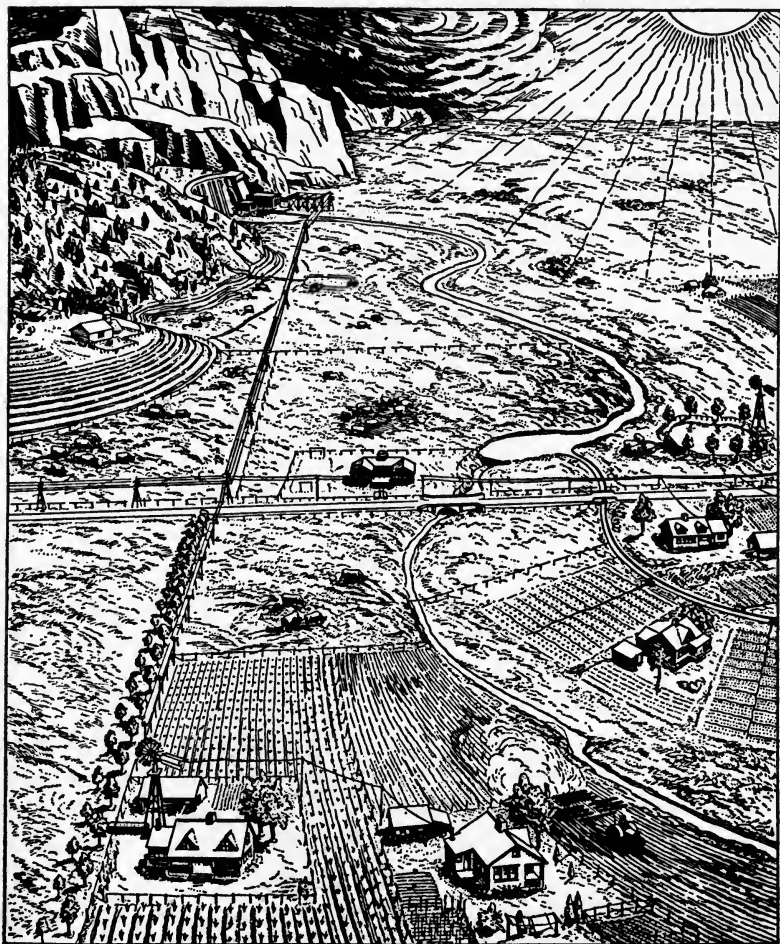
## SUPERVISED LOANS

These activities were merely temporary measures to stave off the disaster of the drought. There was a second type of government activity which was designed to bring some permanent improvement. First there was the problem of the dry farmers and ranchers whose houses and fields were lost in the drifts of the black blizzards of dust. The Resettlement Administration lent money to these people to establish themselves on new land and lent money to farmers and ranchers so they could get a new start on their own land. (See p. 75.)

This agency was later reorganized as the Farm Security Administration. Primarily, the function of this division of the federal government has been to help those who must depend



Overgrazing and bad farming practices on the Great Plains brought erosion, a low standard of living, and a growing destruction of a valuable resource.



By proper land-use planning, terracing and listing the soil, control of grazing, careful use of water, that resource can be protected so that it will support a prosperous society.

on the land either to reestablish themselves on their own land or find new land elsewhere. In most cases this help has been given through carefully supervised loans, made with the understanding that they will be used in such a way that the land will be permanently improved. To accomplish this, the lending agencies help the farmer or rancher make a plan of land management. When this plan is approved, the farmer or rancher gets his money. The Farm Security Administration then checks up to see that this plan is followed. The purpose of this program is to create security for those who live on the land, not a soil "sweatshop" for quick profits.

A new approach to the land-use problem was worked out by the Indian Service of the Department of the Interior. Congress abolished the old Indian land allotment system. According to that system, the Indian lands which belonged to the tribes, rather than individuals, had been divided into privately owned land, so much to each eligible Indian. This land was held in trust for the Indian owners for twenty-five years by the federal government. At the end of that trust period, the land was turned over outright to the Indians, who usually sold it to white men. Thus the Indians lost about two-thirds of their land, and that the best of it.

Most of the remainder of this land was range, fit for grazing only. Under the Indian Reorganization Act of 1934 grazing districts were established on this land. The Indians were lent money with which to purchase livestock, develop the timber resources and farm land on which to grow their food. In giving these loans the government reserved the right to supervise the work carried out by the Indians with the money. Thus the loans became a means to enforce good grazing and forest practice. One of the great problems on the Indian lands is the fact that the plains Indian thinks of wealth in terms of the number of animals he has, rather than the quality. He is particularly fond of horses. These horses have no great sale value, but they consume much

of the range land that could be more profitably used by sheep and cattle. The result of this is that much of the Indian Service land is overgrazed by stock which yields no profit.

All these many government activities were based on two ideas: first, that by providing loans the farmer, the rancher, and the Indian could be saved from poverty; second, the land would be saved by requiring that the borrowed money be spent for land-use practices which would aid rather than destroy the soil.

This control over loans is very different from the usual methods of banks. Private bankers, insurance companies, and the federal land banks had, before the depression, lent a large sum of money to farmers and ranchers with the usual security, the land and buildings of the borrower. The lenders did not make any effort to protect their security, the land, by insisting that the land users manage it wisely. The result was that when the depression came the borrowers who had been bleeding their land could not repay the loans, and the lenders found themselves with nothing but worn-out soil to pay for their loans. And they frequently could get that only after the police or militia had been called out to drive the land users from their homes. The mere right to seize a man's land was no security for a loan.

#### FOREST SERVICE CONTROL OF RANGE LAND

The whole movement for the protection of our natural resources grew out of the demand that the destruction of our forests be stopped. One of the first results of this movement was the establishment of the federal Forest Service, which was created to manage large areas of public land reserved as national forests. Much of this land was also used for grazing, so it is little wonder that the Forest Service was one of the first agencies to work on range conservation.

This is how the Forest Service approached the problem of grass. It told the ranchers that it would issue permits for them

to graze so many cattle on its land at a cost of about 15 cents a head per month. At the same time, the number of cattle grazed was limited. This program started in 1905. In spite of the fact that most of the range controlled by the Forest Service was in bad condition from overgrazing when it was taken over, practically all of it had been restored to first class condition by 1917.

Then came the World War, and the Forest Service had to permit the ranchers to run more stock on its land. The country needed the meat and wool for its armies and those of its allies. The barriers against overgrazing on the Forest Service ranges were taken down. But what happened to their ranges was nothing compared to what happened to other range land owned by private individuals and other government departments.

Immediately after the war, the Forest Service decided to limit grazing on its land again. But here it ran into another problem. The ranchers had expanded their herds to meet the demand for meat during the war. The cattle were security for the loans that paid for this expansion. That is, the owners promised to turn the cattle over to the lenders if they did not pay back the money borrowed.

The Forest Service could forbid the ranchers to graze large herds on forest land. But before the rancher could cut his herd to the number the Forest Service required, those who had lent money on the cattle had to give their consent. This the lenders usually would not do. Besides, the ranchers argued that they could make money with big herds, but not with small herds. They did not want to reduce their stock even if they could.

To get over this hurdle the Forest Service and committees of ranchers worked out quotas of stock each owner should be allowed to graze in the National Forests. These quotas were gradually reduced. Thus a rancher was allowed to put a large herd on Forest land at first, but he had to reduce that number each year until his cattle would no longer be a drain on the grass. When the rancher sold his ranch, which frequently



happened, the Forest Service usually reduced the number of cattle permitted to be grazed by the purchaser.

The net result of more than thirty years of effort to improve range conditions on the National Forest has been summarized in the Western Range Report as follows:

"The trend of depletion of the range has been checked, and notable improvement is the rule. The grazing capacity of the range area in use in 1934 has been improved 19 per cent since 1910. Grazing capacity on national-forest ranges today is, on the whole, 70 per cent of that on the virgin range, as compared to 33 per cent on the grazing districts and the public domain and 49 per cent on privately owned lands in the western states. At the present time, even in spite of a long period of deficient rainfall, the 1928-34 drought, and the extra demands of the 1929-35 depression, only 19 per cent of the range area on national forests is in such condition as to require major adjustments in use to permit continued improvement."<sup>18</sup>

For this use of its grazing land the Forest Service still charges about 15 cents per cow per month. Sheep cost about 4¼ cents per sheep per month. This money, like the money earned from the sale of timber, is turned over to the Federal Treasury where it goes to the general fund of the treasury. One-third of this money is returned to the county in which it was collected to be spent for roads and schools. Thus the federal forest when it takes land out of private ownership returns to that area about as much money as would have been earned from tax revenues. At the same time the county knows that under Forest Service management these revenues will be constant, whereas under private use the revenues would cease as soon as the resources of the land were exhausted.

Unfortunately this policy did not solve the whole grazing problem. Most ranchers could shift their excess herds to railroad, state, and other land, chiefly that controlled by the General

<sup>18</sup> Memorandum from Forest Service, August, 1938.

Land Office of the Department of the Interior. Indeed, the bulk of the grazing land was controlled by one of those three agencies, and it had been for the most part overgrazed for years. Thus, when herds on the National Forests were reduced, those already overburdened areas received an added blow.

There was another flaw in the Forest Service method of controlling range land. This was that it gave permits chiefly to the big cattle operators on the theory that by controlling the big herds the greatest amount of grass would be protected. However this may have been, it worked a hardship on the small ranchers who were forced to overgraze other land. And they were least able to bear the burdens that come with overgrazing. Today, that policy has been changed so that grazing permits are issued according to the need of the rancher rather than the size of his herd. According to this reasoning, a man whose only means of support is a small herd of cattle, dependent on Forest range, has a much greater need than a man with several thousand head and some land of his own. The big rancher can afford to cut his herd and still make a living. The small operator cannot, therefore he is given preference.

Since 1910 Forest Experiment Stations in the range states have been working on the problem of range erosion (see page 183). It was the Forest Service scientists who discovered and developed the methods of restoring grass to the slopes of the Wasatch range near Salt Lake City. Just how serious that problem was you could understand if you could see the enthusiasm with which Forest Service scientists point to the grass growing on the sides of their little terrace dams at the heads of the canyons—grass, real grass, and spreading over the bare patches, holding back the flow of mud and rocks that would sweep down and wipe out the fields stretched out below like squares on a checkerboard.

At Missoula, Montana, Parker Creek and Tucson, Arizona, on the San Joaquin Experimental Range in California, and

several others, the Forest Service range experts study grass and its power to hold the soil. First, how can livestock be controlled so that grass keeps its full vigor? What effect do rodents like gophers, mice, and rats have on the grass cover? The men in charge of the San Joaquin station, for example, will show you special plots where the effects of these animals on grass is studied. How long will it take to get grass back on the overgrazed semi-desert Arizona range? At Parker Creek you can see plots that have not been grazed for fifteen years, and they are just beginning to come back. And you can stand on the rim of the southern boundary of the Parker Creek Station and see the lake behind Roosevelt Dam and the range that surrounds it. This range is eroding, silting up the dam. As you look down on this rapid destruction of land, and then back on the experimental ranges of the station you get some idea of what can be done. But you must go slowly; still not enough is known to be sure of just exactly what to do.

At the San Joaquin station you can see the grass nursery, plots of all kinds of grass grown under all kinds of range conditions. There is brome grass, wheatgrass, wild oats, buffalo grass, Pacific bunchgrass, black grama grass. You must be careful with this grass seed. If you decide to sow one kind, it may not survive in the range climate. Again it might crowd out better grasses. Perhaps it will not have high feed value.

The grasses of the range must meet many conditions and do many things. The best grass for all purposes is the native grass, but there is little of that left. Already practically all the range grass in California is foreign grass, grass dropped from the covered wagons of the pioneers, grass brought by birds, grass seed carried in the wool of sheep as they were driven from one state to another. And most of this foreign grass is poor forage, like Russian thistle, which protects the soil but little and has hardly any forage value.<sup>19</sup>

<sup>19</sup> Letter from Soil Conservation Service, August 19, 1938.

A brief outline of the various other government agencies coöperating with or working alongside the Forest Service Range Experiment Stations gives some idea of how the whole complicated machinery is brought to bear on one land-use problem. In addition to the Forest Service, there are six other bureaus in the Department of Agriculture working on the range problem. The Bureau of Plant Industry studies the plants of the range and the problems of keeping proper pasture and forage crops. The Bureau of Animal Industry studies the relation between animal husbandry and poisonous range plants. The Biological Survey works on the wild-life angle of the range problem. The Bureau of Entomology and Plant Quarantine concentrates on the insect problem. The Bureau of Agricultural Chemistry and Engineering develops methods and machinery best suited to the needs of range soils. The Bureau of Agricultural Economics tries to draw up plans which will solve the range problem. The Soil Conservation Service works on range erosion. The Farm Security Administration tries to work out better conditions for the ranchers. The Bureau of Census of the Department of Commerce collects statistics about livestock, pastures, crops, farms, and ranches in the range country. The Tariff Commission studies costs and returns on range products such as wool and beef. The Division of Grazing in the Department of the Interior, like the Forest Service Range division, studies the whole problem of the range as it relates to the land under its authority.

In addition to these, there are the State agricultural experiment stations in the range states, the laboratories of the colleges in the area, and private organizations like the Boyce Thompson Institute for plant research all of which try to find solutions for range problems.<sup>20</sup> With all of these agencies working at

<sup>20</sup> *Range Research in the United States* by W. R. Chapline, Chief, Division of Range Research, Forest Service, U. S. Dept. of Agriculture, Washington, 1937, pp. 3-4.

once, the problem of government becomes more and more how to organize its attack on range problems. In that field, we have just begun.

#### THE SOIL CONSERVATION SERVICE

The Soil Conservation Service has attempted to solve the problem of the destruction of range land through its demonstration program. The basis of this program is the demonstration area. The experts of the Soil Conservation Service select a place that meets these four requirements: (1) it must be a typical example of erosion in the particular region; (2) it must be so located that it can be visited by a large number of nearby land users; (3) the land must be of such a kind that it can be successfully improved by a unified erosion program; (4) the farmers and ranchers in the area must be willing to coöperate with the Soil Conservation Service.

When such a region is found, the Soil Conservation Service signs an agreement with the individual land-users to carry out erosion control work on their land. The landowners promise to continue the erosion control program for five years and furnish a certain amount of labor and material. In return for this, the Soil Conservation Service provides equipment, technical experts, and labor to list the fields, lay out strip crops, contour plow the land, stop gullies, build check dams, and other erosion control works. From the point of view of the Soil Conservation Service, the value of this work is not so much that it helps a few land-users. It hopes, rather, that the farmers and ranchers in the whole region will be convinced by this example of good soil conserving practice that such methods are profitable. (See page 72.)

In addition to the demonstration areas, the Soil Conservation Service assists in managing 36,700,000 acres of government owned land in the Southwest, mostly Indian Reservations. On this land the Soil Conservation attempts to work out

ways of restoring eroded land to a point at which it will again support a reasonably large population. The Soil Conservation Service also directs the erosion control activities of about 360 Civilian Conservation Corps camps. It also assists in carrying out plans for Soil Conservation Districts that have been established under the Soil Conservation District law (see page 79).

Another Soil Conservation Service attempt to establish successful land-use management in the range states is a land purchase program. This agency has ninety-five land utilization projects which contain 2,000,000 acres of land.

The first step in the program was to purchase key areas of land. These key areas were regions in which land ownership was so confused that no one owner had enough land to run a successful ranch. The Soil Conservation Service land, plus nearby state and private land, was re-leased to coöperative grazing organizations so that one large unit of grazing land could be brought under the control of the association. With enough grazing land, and control of the number of animals to be grazed on that land, the grazing organizations had a better chance of success than the small owners with too many cattle and not enough range.

When buying land, areas were selected in which water holes for livestock could be developed. Before leasing the land to the grazing associations, these water holes were developed, wells were drilled, poor areas were reseeded, fences were built, soil erosion was checked, and the quality of the range was improved. In one region the Soil Conservation Service estimated that the costs of local government had been cut by as much as 10 per cent because the land purchase program made it possible to close certain roads and consolidate schools.

In general, the Soil Conservation Service project is a land purchase, range improvement program designed to make it possible for ranch owners to organize and develop a successful

ranching community. The chairman of a meeting to consider this program in Roundup, Montana, put it this way:

"I have been in the livestock business for 25 years. . . . I have seen central Montana go from livestock to farming, then back to livestock raising. We have gradually seen this program coming back. But only under improved conditions due to the development program, can the ranchers survive."<sup>21</sup>

#### THE DIVISION OF GRAZING

By far the most ambitious attempt to regulate government range land is the Taylor Act. This act passed in 1934 permitted the Secretary of the Interior to set up the Division of Grazing as part of the Department of the Interior. It has set aside 142,000,000 acres of the public domain to be managed in such a way that the grass will be saved and the soil kept out of the streams. It closes to settlers all of the Public Domain, that once seemingly endless middle of America. It is the official end of the free land period of American history. Today's pioneers must go to the highly civilized, irrigated, and usually electrified reclaimed lands opened up by the Bureau of Reclamation.

The purposes of the Taylor Act are stated thus in its preamble: "To stop injury to the public grazing lands by preventing overgrazing and soil deterioration, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range."<sup>22</sup>

If you are going to control the way in which land is to be used you must either own or lease it. In the range country the land is a checkerboard of squares of federal land, state land, county land, railroad land, private land, and tax-delinquent land. The first step in controlling grazing is to get a large solid block of suitable land under a single control. Where the owner-

<sup>21</sup> *The Agricultural Situation*, May 1938, Vol. 22, Number 5. Washington, D. C. A publication of the Bureau of Agricultural Economics.

<sup>22</sup> The Taylor Grazing Act, Approved June 28, 1934 (48 Stat. 1269) and amended June 26, 1936 (Public, 827, 74th Cong.).

ship of land is as mixed as it is in the range states, some method had to be found to achieve this single control.

For this reason the Taylor Grazing Act gives the Secretary of the Interior the power to exchange public lands for private land if any unit of government or individual asks for such an exchange. If a block of private or state land is in some important part of a block of federal grazing land, the Secretary of the Interior can trade some of the outlying land on the edge of the federal land for the intruding private or state land. In the case of small bits of isolated federal grazing land, the Secretary of the Interior may sell blocks of 760 acres or less of such land. If it is not sold, it may be leased to stockmen with the condition that it be properly grazed.

Under the Taylor Act, the ten range states each form a region. This region is supervised by a regional grazer who is appointed by the Secretary of the Interior. The regions are divided into districts. Each district is an area within logical boundaries that can be efficiently managed. The district boundaries are determined at public hearings and may include both public and private land.

Each district, once it has been established, elects from among the local stockmen who are going to graze cattle or sheep in that district a local advisory board. This board is supervised by the director of grazing in Washington and the regional grazer. These boards recommend that certain areas be leased to individuals or groups. These recommendations must have the approval of the director of grazing. The boards may also propose rules governing the use of the range, but the Secretary of the Interior alone can put such rules into effect. In all cases he is the final authority with the power to make or change any rules affecting federal grazing land.

Only people who have used the government range for livestock for two consecutive or three non-consecutive years before the passage of the Taylor Act may use the range controlled by



the act. No grazing permits for range rights are issued for stock beyond the number an owner can provide for during the season when the public range is closed. In some cases a rancher is permitted to graze a certain number of animals in a certain area. In others, all the applicants who are accepted are permitted as a group to graze so many animals in that district. In both cases, the permits may run for ten years or less. Independent local ranchers are given first preference over other livestock owners. Unlike the Forest Service grazing rules, the Taylor Act does not allot the land to ranchers on the basis of need. To get a grazing permit from the Division of Grazing the important requirement is that the applicant be a capable, well-established rancher who has enough stock, land and water of his own to care for his herd when the government range land is closed.

The Division of Grazing charges a fee for the privilege of using the land it controls. This fee has been set at 5 cents per head of cattle or horses per month and 1 cent per head of sheep or goats per month. Later, when the range has been sufficiently improved, this fee will be raised. The purpose of this fee is to charge the ranchers a fair price for the benefits they receive from the range. Twenty-five per cent of the amount received from these fees may be appropriated by Congress to pay the costs of drilling wells, building fences, and restoring grass to the land. Fifty per cent of the fees collected are returned to the states in which they are collected, the money thus given to be spent for the benefit of the counties where the ranchers paid the fees. This means that the grazing districts provide revenue to counties which would otherwise be hard pressed to find money for schools and roads. The remaining money stays in the federal treasury.

From the point of view of government, it is of the highest importance to know who has the power. In a democracy, the electorate is supposed to have this power. In the case of the range, Congress decided that the Secretary of the Interior, an

appointed rather than an elected officer, would have to take over the control of the range in order to save it. It was a task most individuals in the range states were unable to undertake. But in turning the range control over to the Interior Department, two checks were put on it. In the first place, the people of the region were given the opportunity to recommend what they believed would be the best practice for their particular area. In order to prevent these people, however, from selfishly deciding to destroy the range for their immediate profit, their suggestions have to be approved by the Division of Grazing. Also the Division of Grazing can enforce any rules drawn up by its own officials. And in order to check this power of the Division of Grazing, the Senate has the right to accept or reject the director of the Division of Grazing selected by the president. Congress also has the power to end the Taylor Grazing Act whenever it sees fit to do so. Therefore, if a majority of the people of the country decide that the Division of Grazing is not doing a good job, they can elect a Congress which will suspend the Taylor Act. The fact is, however, that the Division of Grazing would have to become very corrupt before enough people would be aroused to elect a hostile Congress.

The power flows from Congress to the Interior Department, to the Division of Grazing, to the people in the affected region, back to the Division of Grazing, and from them to Congress again. The weakest link in this chain is the people in the affected region, since they have no actual power to control the Division of Grazing. Their chief role is to supply local information to the men who administer the Taylor Act.

Here is another way of looking at the government control of the range. The destruction of the range is a regional problem. The people in that region were unable to do anything about it. The Wisconsin dairy farmer and the Wall Street banker may not give a whoop for the problems of the rancher. However, the dairyman and the banker and the rancher are like so

many men in a rowboat. If one man cannot pull his oar, the whole boat is slowed down. And if the sea is rough and dangerous, everyone in the boat is endangered by that one man's weakness. In cases like this, people often make the mistake of blaming the weak man. There is a good chance that he is not responsible for his weakness. It may well be that it is something the others have done to him. In any case, people who want to reach a goal must help one another.

That was more or less the idea of Congress, which is supposed to think of the country as a whole. Congress decided that the range problem, along with many other regional problems, was a national problem. The argument was that the whole country loses when one section is in trouble. Therefore, they directed federal money and a federal department to try to solve that regional problem.

The great danger of such a process is that a national agency may not understand the best way to deal with regional problems. After all, Washington is a long way from Albuquerque, New Mexico. In order to meet this difficulty, the district advisory boards were set up so that the national administrators of the Taylor Act would have a source of local information. At the same time, the Grazing Division was so arranged that each region would be managed by a director in that region.

Once you give power to local people you are in danger of another difficulty. Local groups are apt to think only of how to care for themselves without considering the effect such efforts may have on others in other places. There must be a balance of power between the national and regional groups if the interest both of the nation and of the region are to be properly handled. Therefore, the Taylor Act gave the Division of Grazing the power to supervise the work of the local boards. And Congress, national body, has the power to control the whole process according to the wish of the majority of all the voters. Thus, from this point of view,



lives on another stream. He builds a dam across the stream and diverts the water into a series of irrigation ditches. People downstream protest about this but the courts declare that B has a right to use this water as he chooses. In which part of the country does A live and in which part does B live?

3. Suppose you are appointed by the federal government to make a survey of the use of range lands in Wyoming. The government wants to use this survey as a source of information so that they can draw up a plan for balanced range use. What kind of information shall you try to get? Write a short report of this imaginary survey.

4. Take a piece of sod. Put it in a wooden box and tilt the box to an angle of about 45 degrees. Rest the box in a pan. Now take another box. Fill it with earth, tilt it, and rest it in a pan as you did the box with the sod. Get a sprinkling can or any ordinary can with holes punched in the bottom. Fill it with water and hold it over first one box and then the other. Now measure the amount of silt and water in the pan at the bottom of both of the boxes. This will give you some idea of the effect of sod in holding the soil.

5. Find out what happens to the tax-delinquent land in your county. How much time is the taxpayer given to make up back taxes? What happens to the land when it is taken from the taxpayer?

6. Assume that your whole class are cattle ranchers in one region in Montana. The ownership of the area is divided among a great many people. Part of it is federal land, part state land, part private land. You decide to apply for permission to form a grazing district. From among your classmates elect a board of directors. Let 10 per cent of the class be tenants, 60 per cent owners of small ranches, 15 per cent owners of medium-sized ranches, and 15 per cent owners of large ranches. Set up a grazing district as it is outlined on page 174. Proportion the land, elect committees, draw up a land-use plan, and so on.

Get from the library a copy of the *Future of the Great Plains*, and you will find maps on pages 150-158 of Montana counties with the various types of ownership marked. You can assign to each member of the class one of the plots marked on the map.

7. Suppose you were sent to the region mentioned in the previous question by the Division of Grazing, to regulate grazing on government lands in this region. One of you can be the Grazing Authority official and the remainder can be local ranchers. Just what should you do to regulate grazing in an attempt to restore the range?

8. Draw a chart of the flow of power under the Taylor Grazing Act, the Forest Service range control, and the Montana District grazing law.

#### DEBATES

1. Should the Forest Service through its grazing regulations favor owners of large herds or owners of small herds of cattle?

2. In view of the fact that it was impossible for a rancher to make a living on less than 2,000 acres of range land, were the ranchers justified in taking in more than the acreage allowed to them under the Homestead Acts?

3. Which is more important, to preserve the grass on the range or to preserve the profits of the ranchers?

4. Should the federal or local government have the final say in the management of range lands?



pattern through all the American settlements from the Atlantic Coast to the Mississippi. The first settlers naturally looked on the forests as something which had to be removed if they were to plant crops. In many cases the trees were simply killed by girdling, and burned. The settler used the timber for fuel, housing, and fencing.

He cleared only the better land and left the timber on the poor and rocky soils. Though a good deal of poor land has been unwisely cleared for farming, the bulk of the clearing for agriculture was necessary. The real forest problem has come chiefly from the destruction of forests by commercial lumbering on the vast area of remaining forest land that was not suitable for farming.

This rapid destruction really started when the American people began to gather in towns and cities. By the early 1800's these cities and towns became a market for timber. At the same time, the canals, the Cumberland Road, and, later, the railroads, were able to carry lumber from distant forests to the market.

These two factors, markets and transportation, combined to start a period of tremendous timber cutting. Depleted forest land sped like a rash westward through New England, New York, Pennsylvania, and the Lake states, then south through the southern pine country and finally to the virgin forests of the Far West.

The attitude of the federal government toward the use of forest land was originally the same as that of the farmer. From the system of land grants under the Northwest Ordinance to the Timber and Stone Act of 1878, the forest resources were ignored. The original land grants to the western railroads had not recognized the value of timberland. The railroads were permitted to take the government land grants whether they had timber on them or not. The government felt that this was fair



enough, since the railroads needed the timber, first for ties and construction, then for fuel.

But when the railroads began to sell this timber to lumber companies at a considerable profit, the government decided that it was time to change its policy. This change in policy was the Timber and Stone Act. According to this law, lands with valuable timber or gravel pits were reserved for settlers. The attempt to distribute timberland among the settlers, however, was not successful, because lumber companies sent in trainloads of men to pose as settlers, take up land, and later sell it to the companies. In Modoc County, in California, more than 85 per cent of 25,000 acres of timberland was taken over by the lumbermen by this device in less than a year. Over 14 per cent of this went to one man, the rest went to three others.<sup>3</sup> There were many government restrictions to prevent this, but the lumber companies found ways of overcoming all these restrictions. For instance, the law said that a settler had to build a house 16 feet long by 14 feet wide on the land on which he settled. The settler would file a report with the government saying that a building 16 by 14 had been built. He did not think it necessary to mention, however, that his building was 16 by 14 inches instead of feet.<sup>4</sup> By this method land worth \$20,000 per quarter section was acquired for \$400.

The tremendous frauds practiced in administering the Timber and Stone Act soon showed that something else would have to be done, if the forests were to be preserved.

As early as 1877, Carl Schurz, then Secretary of the Interior, influenced by his knowledge of forestry in his native Germany, suggested that the public timberlands be reserved as national forests. Some years later the American Association for the Advancement of Science acted to have his suggestion made into a law. In 1891, the Association succeeded

<sup>3</sup> Hibbard, *op. cit.*, p. 468.

<sup>4</sup> *Ibid.*, p. 390.

in convincing Congress that a law should be passed permitting the President to withdraw from settlement valuable timberland and put it under the administration of the Department of the Interior. The law, which was to have the most profound effects on the conservation of natural resources, was a brief and obscure "rider" attached to an appropriation bill. In 1897 Congress created in the Department of the Interior a division to study forest problems. This was later put under the Department of Agriculture.

At first the lumbermen fought these withdrawals of timberland. In spite of this, during the administrations of Presidents Cleveland, Harrison, and McKinley, about 60,000,000 acres of forest land in Colorado, California, Wyoming, and Oregon was closed to settlement.<sup>5</sup> Unfortunately, this was not enough to stop the rapid destruction of the forests. When President Theodore Roosevelt came into office, Gifford Pinchot, head of the newly created Forest Service, persuaded him to increase the forest reservations to 172,000,000 acres.

The important thing about the depletion of the forests was the effect it had upon the land itself and the people who depended on the land. Take, for example, northern Wisconsin, where there was one of the finest stands of white pine in the world. A generation ago the lumber companies came into that region and cut every available stick of wood. There seemed to be so much of it that they went on cutting as if there never would be an end. But the end did come in a very short time. In the wake of these lumbering operations were left millions of acres of land with nothing on them but highly inflammable slash, that is, the branches and tops of trees which had been cut down. This slash was tinder box, and in the dry season it burned furiously. The fires destroyed rich humus layer of the soil and whatever young trees had escaped destruction by the logging.

<sup>5</sup> Van Hise and Havemeyer, *op. cit.*, p. 243.

Today in that region there is little more than a bristle of aspen, and scrub jack pine trees with a very limited commercial value.

There is another side to this forest depletion which might be called the human depletion. The lumber companies brought workers into the forests to cut and saw the trees. Towns were built. Roads were cut through the forests. Schools and county governments were set up. The tradesmen in the towns depended on the lumber workers for their money. The cost of the schools and the roads and the government were paid by taxes on the lumber operations.

Now the lumber operations have ceased. The tradesmen have little business. The counties have little tax revenues. In many cases some of the people who had come in to work in the forests stayed on when the forests had been cut off. Either they could find no jobs elsewhere, or they were unable to move their families to a new area, or they thought they would try to farm on the cut-over land. Today, many of these people have to depend on some kind of government relief.

Trees are plants just as much as wheat and corn and cucumbers are plants. However, a forest has laws of growth, decay, and reproduction that are quite different from those governing farm crops. These laws, like the laws of agriculture, can be studied and mastered and used to make the forest a permanently living, growing, economically productive unit. Reduced to very simple terms, the basic law of good silviculture is to cut only the older bigger trees and leave the younger to grow. Thus you always have a forest producing timber, providing income, and furnishing work.

The lumbermen, however, partly out of tradition, partly because they do not understand the laws of forest growth, usually cut or destroy all the trees, big and little. The forest ceases to exist, it yields no income, it pays no wages, it provides no taxes. It becomes a desert, and leaves behind it a trail of poverty,

abandoned communities, industries destroyed, and workers set adrift. That is the inevitable result of forest depletion.

Federal and state governments have long been trying to do something to prevent this uneconomic use of land. They have the example of what has happened in the cut-over regions of Michigan, Wisconsin, Pennsylvania, the South, and the Pacific Coast. They are aware of the problems of stranded populations, bankrupt county governments, and burned soil. Thus far, with the exception of a few state governments like those of Pennsylvania and New York, the only agency which has attacked the problem in a large way is the Federal Forest Service.

#### TIMBER DEPLETION

There are two regions in the United States today in which there is extensive timber cutting. These are the South and the Pacific Northwest. The South, one of our chief lumbering regions, is also rapidly becoming a great pulp-wood region, with its fast-growing loblolly, slash, and long-leaf pines. In the West the magnificent Douglas fir, Sitka spruce, Ponderosa pine, incense cedars, with their stumps six feet in diameter and their trunks reaching up into the air 200 feet, are a source for structural timbers, lumber, pulp, and poles. One important thing about both of these regions is that they are at a great distance from the biggest market for timber products, the Northeastern industrial states.

To get some idea of just how or why the timber is cut as it is, take for example a lumber company on the flanks of Mt. Shasta in northern California. That company has been operating for a great many years in a region rich in Ponderosa pine and firs. Much of the land was acquired by having employees homestead rich timber sections and then turn it over to the company. Today that company has practically reached the end of its supply. It has invested many thousands of dollars in building railroads to haul the timber from the forest to the

mill. Many more dollars were used to pay for heavy machinery to work this timber. It has built up communities of mill workers and lumbermen. When the supply of timber is gone in a few years, the investment in the machinery will be wiped out, and the workers who have depended on the mill will have to find new jobs, if there are any. On the areas which the company has cut, nothing is left standing but worthless brush. Many times fires have swept over the cut-over regions, destroying the fertility of the soil and the few young trees.

#### SUSTAINED YIELD MANAGEMENT

Two things give a key to the solution of this problem, fire protection and proper timber management. To protect the forests from fire, the cut-over lands as well as the uncut timber must be watched constantly in dry times. The heavy slash left on the ground after cutting must be safely disposed of. During periods of high hazard the land must be patrolled so that fire wardens can put out fires before they spread. The second part of proper timber management is a system of cutting that will keep the forest growing. This is called "sustained yield management." Sustained yield management means harvesting the mature trees in such a way as to protect the younger trees and permit the natural reseeding of the forest. By this system the ripe trees are cut as they mature, and the younger trees are left to mature. Forestry, as a business enterprise, depends on sustained yield management.

When a lumberman has a forest which is permanently productive, he has what amounts to an efficient forest factory. And just as a cotton mill that runs all the time is more profitable than one that must shut down frequently, so a forest that yields merchantable timber without interruption is more profitable than one which can be cut only once in a generation.

The basis of sustained yield is this fact. The amount of timber cut from the forest annually or periodically must not ex-

ceed the growth for that period. Hence, there is always a constant amount of timber on the ground. This remainder is called forest capital. Capital may be thought of as a reservoir of water. It is fed by a never-failing spring (the annual growth), and loses at its outlet (the annual cut) the same amount as received from the spring. Thus the level of water in the reservoir remains constant.

In practice a forest under sustained yield management may be made up of a single large stand of trees of all ages from seedlings to mature veterans, or of many small even-aged stands ranging from newly reproduced stands to middle-aged and old stands. In either case there is such an even distribution of ages from young to old that the proper regulation of cutting provides continuous production year after year without depletion.

There are a great many theories about sustained yield, and more than one way to achieve it. It is difficult to get people to agree what is the best method, but practically all foresters and a good many lumbermen agree that sustained yield is the only form of forest management which is suitable for American forestry. In practically all European countries, the forest users have hundreds of years ago gone through a period of waste similar to that of the United States. Today, sustained yield or at least conservative cutting, is enforced by law in most European forests.

Not only is sustained yield management better for forests but it is also better for the lumbermen in the long run. Most studies which have been made of sustained yield cutting indicate that there is a higher rate of profit from such management than from any other. Certainly, from the point of view of the American people as a whole, it is more profitable to have forests cut on a continuous production basis than to have them clear-cut and burned, then restocked artificially at great cost. Clear-cut forests mean stranded populations, eroded soil, destroyed water-

sheds. Sustained yield means a stable and prosperous population, productive soil cover, and protected watersheds.

#### CONTROL OF FOREST FIRES

The causes of fire in timber are divided into four groups: carelessness, lumbering operations, lightning, and incendiarism. The astonishing thing about all the statistics that have been gathered about fires in forests is that about 70 per cent of them are deliberately set. The reasons for setting fires are a false belief that fire promotes plant growth or some grudge against the timber owner or manager, or, as has sometimes happened in National Forests, in order to get a job to help put it out. In the South, particularly, where a lot of grazing is done in woodland, many grazers believe that by burning over the forest every year the quality of the grass is improved. It is true that land which has been burned over one or two years does have a better crop of grass the succeeding year. But after a number of burnings the humus in the soil is destroyed and plants of little or no grazing value take the place of the grass and trees. Unfortunately, people are more apt to remember that on last year's burning there is good grass rather than that the piece which has been burned for many years is a barren waste land.

Smokers and campers are the primary cause of fires set by carelessness. Many people from the city passing through the forests have no idea how easily a forest fire can be set, or how quickly it can spread. Inexperienced campers often forget that their camp fires may set a whole forest ablaze. The great Tillamook fire in eleven days burned over 244,706 acres of timber. This was America's largest remaining virgin stand of privately owned timber. It was worth approximately \$375,000,000. One Civilian Conservation Corps boy was killed fighting the fire, and a score were injured. "So dense was the smoke-fog during the days that lights in the coast towns had to be turned

on, chickens went to roost, motors crept along the roads though miles away from the fire. Enormous clouds of smoke rose to an estimated height of 40,000 feet and billowed west over the Pacific Ocean. Ashes and cinders fell two inches thick along the coast and on the beach. The loss of wild life was appalling—many charred bodies of deer were found, in most cases lying with their heads pointed toward the west as they ran to escape the racing inferno.”<sup>6</sup>

In spite of the most extensive precautions, fires still sweep through the forests. In the summer of 1938 this story appeared in newspapers.

“Cooler weather and diminishing winds brought encouragement to thousands fighting some 350 fires in Washington and Oregon. Fires in the coastal area were being subdued gradually but C. H. Hunnter, forest service warehouse manager at Spokane, described conditions in eastern Washington and northern Idaho as a ‘nightmare.’ Smoke was so dense, he said, lookouts were unable to spot new fires, twelve of which were reported in Washington.

“Fifteen hundred men, aided by airplanes, fought two fires in northern California forests.

“The worst blaze advanced along a twelve-mile front in the Klamath National Forest.

“Another fire flared out of control in the Trinity Forest. Six hundred men fought this blaze.

“Airplanes performed scouting duty and brought food to men in the rough mountain sections.”<sup>7</sup>

The Civilian Conservation Corps has helped to solve the problem of fires set by the people who hope to be hired to put them out. There was nothing to be gained if only Civilian Conservation Corps boys were going to fight the fires.

The Forest Service has developed elaborate methods of fire control. In the lumber regions, particularly those of the Pacific

<sup>6</sup> *Great Forest Fires of America*, p. 10.

<sup>7</sup> *New York Times*, Associated Press Dispatch, July 23, 1938.



Northwest, the private companies and state governments have on hand a large quantity of fire-fighting equipment and very extensive systems of fire lookouts. In southern California, where forest cover is so essential to watershed protection, county as well as state and federal fire protection agencies have been developed.

The Federal Forest Service protects the national forests as a part of its regular job and, at the same time, protects surrounding private forests, since the fires on that land are a menace to the national forests. Washington and Oregon have very complete state fire protection laws.

To help promote this organized state forest protection, the federal government has passed two laws appropriating money to be spent by state fire protection agencies. This federal money is given with the understanding that the states will spend at least an equal amount for the same purpose. This is what is known as a "grant in aid." Forty-four states have qualified for these grants. In 1936 the states and private persons spent \$4,778,544.73 for fire protection. The total spent was \$7,083,306.<sup>8</sup>

Oregon and Washington charge private operators for protecting their land if they do not have a fire-control system of their own. Oregon, for instance, charges the operator a rate of not greater than 5 cents an acre for this protection. In both Washington and Oregon, owing chiefly to the pressure from the lumber companies themselves, laws were passed regulating the burning of slash. In this lumberman-sponsored state law there is a rule that the state forester can order lumbering operations to stop if weather conditions make the fire hazard great. The lumbermen wanted these laws passed because there is so much chance that a fire which gets under way on a careless operator's property will spread to the timberland of another. Therefore, it is now against the law to burn slash except at certain intervals selected by the state foresters. On land on

<sup>8</sup> Forest Service Report, *op. cit.*, p. 27.

which the requirements of the state slash-disposal laws have been met, the state gives a certificate to the lumberman. If a fire starts on this land after the certificate has been issued, and spreads to the land of another, the owner of the land on which the fire started is not responsible. If, on the other hand, a man burns his slash without a certificate and the fire spreads to the land of another, the owner of the land on which the fire started is responsible for the damage to the other operator.

One of the side issues of fire control is tax-delinquent land. Obviously, after land has been clear cut, it will be a long time before it yields a profit again. Many owners of such land simply stop paying taxes once the timber has been cut off and sold. After a certain period of time, the state takes over the ownership. Between the time that the owner abandons the land and the time the state takes it over, the land may get very little fire protection. It so happens that fires start very easily on cut-over land, and such fires are very costly because they kill the young trees which have started to grow. Frequently fires on such an area leave it completely sterile. The owners of cut-over land say that they cannot afford to pay for state fire protection and the state tax, since it will be many years before the land will again yield a profit. They believe that one of the best conservation measures would be for the state to reduce taxes on cut-over land; then the owner could afford to keep the land and protect it.

Another answer to the same problem is sustained yield management. If the land were properly managed so that the annual cut did not exceed the annual growth, it would yield a profit continuously, and thus the taxes and fire protection could be paid out of annual profit.

#### THE TOLL OF INSECTS AND DISEASE

The total amount of timber killed by insects is greater than loss by forest fires.<sup>9</sup> Usually this destruction is not so spectacular

<sup>9</sup> Van Hise and Havemeyer, *op. cit.*, p. 260.

as a forest fire, but that in no way lessens the loss to the forest. Such diseases as the chestnut blight, which arrived from the Orient around 1901, proceeded in a few years to kill every chestnut in the entire northeast forest region. Thus, one of the most valuable of our hardwoods was practically exterminated.

Between 1895 and 1919 in the Black Hills of South Dakota and Wyoming a billion and a half board feet of yellow pine was killed by the pine beetles.<sup>10</sup> Between 1921 and 1927, over 500 million feet of some of the finest virgin timber was killed by these insects in the Modoc forest region in northern California. These beetles, along with the spruce budworm, the gypsy moth, and such fungi as white pine blister rust, cause a tremendous amount of damage every year. Unlike fire, destruction by insects and disease is not so much a matter of carelessness. However, in regions that have been burned-over or in stands heavily cut, the weakened trees are much more vulnerable to both insects and disease.

The Forest Service and the Bureau of Entomology and Plant Quarantine in the Department of Agriculture are working to control these diseases with the aid of state foresters and state agricultural colleges. The Department of Agriculture through the same bureau tries to keep other insect pests out of the country. All imports into the United States which might carry new and dangerous timber diseases must pass the Plant Quarantine inspection. This inspection was made necessary by the fact that the majority of the dangerous tree diseases have been imported from abroad.

#### SOIL AND WATERSHED PROTECTION

One of the direct effects of clear-cutting timber is to leave the soil exposed to the force of running water. In the section on water we discussed the route of water by way of infiltration

<sup>10</sup> *Ibid.*, p. 259.

and percolation as opposed to the route by way of run-off. When water falls on a forest much of it is evaporated from the leafy tops before it reaches the ground. When it does reach the ground it is filtered through the thick litter on the forest floor. If the trees are removed, the rain falls directly on the forest litter, washes it away and lays bare the soil. Everyone knows what happens when running water strikes bare soil.

Most of the timber that has been cut within the past generation or so has come from hilly land, frequently in mountainous regions like the Ozarks, the Alleghenies, and the Cascade ranges. The two major factors affecting run-off are slope and soil cover. When the forest on these hillsides had been cut, the steep slopes were left bare. The watersheds that once held back much of the heavy rains now send torrents down into the great river systems that have their source in these uplands.

The role of the forests in holding the water and soil in the watersheds has long been a well-known fact. Indeed, the first forest laws setting aside federal forest land were passed partly with the idea that the federal government had the right to protect watersheds. The reasoning behind this was that watersheds controlled streams and navigation, and the control of navigation is a duty of the federal government.

#### THE FOREST AND THE COMMUNITY

Not far from Duluth, Minnesota, is the little town of Cloquet. Cloquet is a famous forest town. It has gone through three periods of American forestry. Once Cloquet was the center for sawing the virgin white pine that grew there. By 1918 these dense forests had been practically destroyed. The flat glacial plain in which Cloquet is built was covered with heaps of brush and slash and young trees. By October of that year, there had been but 22 inches of rainfall for the last twenty months. Somebody did not put out a cigarette before

throwing it away, a campfire was left unextinguished, perhaps an impatient farmer was foolish enough to burn brush in such weather—whatever happened, on the afternoon of October 12 a strong wind came up. It fanned the small fire into a roaring blaze. Cloquet, a town of 12,000 people, most of whom worked in the sawmills, was caught in this sea of fire and wiped off the face of the earth. Fortunately for the inhabitants of the town, trains were able to rush them to safety before the town was destroyed. But in the smaller settlements in the country around, 400 people were burned to death. Thirty million dollars worth of timber and property was destroyed, and it was just a matter of luck that saved the city of Duluth. Thus Cloquet celebrated in a big way what might be called the second period of American forestry.

Today Cloquet has been rebuilt. State highway No. 33 winds through the town which rarely extends beyond the highway. In all directions as far as you can see is the great scar left by the Cloquet burn, a few charred stumps and a bristle of young aspen. You might ask what happened to the 12,000 inhabitants of Cloquet when they came back to the smoking ruins of their town. Most of them didn't. They had to start anew in some other place. If you go out along the roads you will come across box-like houses covered with tarpaper, ramshackle barns, a few cows, and one or two flat fields with a not very heavy crop. That's what happened to the inhabitants of Cloquet who stayed behind. They are still trying to get a living from the land, but that living is no richer than the burned-over land.

Traditionally in the United States, the pattern for land use was something like this. The forest was cut. Land was taken over by agriculture. Towns grew up, and finally there was an urban center with factories surrounded by an agricultural area. So far as Cloquet and a great many more of the lumber areas

of the lake states are concerned, the first part of the pattern was developed rapidly enough. The land was cleared for agriculture with a speed that would have delighted the followers of Daniel Boone. But the farmers who followed the wood-cutting in Cloquet, unlike the farmers in the blue-glass region of Kentucky, found that the soil was not adapted to agriculture. Here the pattern collapsed. The glacial land on which the white pine forests grow simply won't produce good crops. It is suitable only for forest land. Thus as in many other cases of recent timber cutting, the plow has not followed the axe. This means that little islands of stranded communities are left behind on many of these areas that were once heavily wooded. These people live on sub-marginal land and they soon become sub-marginal families.

It is possible that the town of Cloquet may also represent a fourth and coming period of American forestry. As you come into the town from the east you notice on either side of the road there is a factory, and again at the end of the town there is another factory. These three factories depend on the aspen wood from this land for their raw material. The best wood goes to the clothes-pin factory, the next best wood goes to the match factory, and finally the worst wood goes to the pulp mill. For the raw material these factories pay about \$250,000 a year, most of which goes to the farmers who cut the wood from their land. This adds about \$300 a year to the average farmer's very small income. The use of aspen suggests a future use of forest products which may support a large number of people now living on sub-marginal land. It all depends primarily on whether the forest products are used wisely.

About 25 per cent of the timber in the United States is on farm woodlots. When pulp factories, which can use this wood are built in an area where pulpwood is available, the farmer has a market for his wood. This enables him to add to his income during the winter months when he isn't able to farm.

In the southern part of the country pulp mills depend a great deal on these farm woodlots for their supplies. The question is: Are the farm woodlots being cut in such a way that there will always be a timber supply and will the mills buy enough timber to support the farmer?

#### THE FORESTS AND TAXES

In most states, forest land is taxed according to the value of the timber on the land. Thus if you have an acre of good timber, the tax will be high. If you cut every stick of good timber, you will get your money back and at the same time the tax will be reduced. If you just cut the right trees you will get a very little money back, but your taxes will remain high. In other words, the man who tries to grow timber or practice sustained yield forest management is penalized by having to pay more in taxes over a longer period of time than the man who buys a stand of mature timber and cuts it right away. This tax situation is very similar to the problem of taxing mineral land. (See page 245.)

Several state legislatures have become aware of the effect of this kind of taxation on forest conservation. Various systems have been worked out to make the tax an aid to conservation rather than a destructive measure. One such system is the adjusted property tax. By this method, each year that an owner of forest property keeps his timber rather than sells it, the tax is reduced. Thus if a man plants trees he knows that the taxes on his timber, so long as he does not cut it, will grow less and less. Therefore he will have a good reason to let his timber reach maturity before he cuts it. The second system is the deferred timber tax. According to this, the owner of forest land pays no tax until the timber is cut. The trouble with this is that in areas in which there is a lot of forest land there will be no tax revenues for many years. A third plan is called the differential property tax. This system puts a tax on timber-

land lower than the tax on other types of property. The amount of reduction is based on the number of years the timber has been standing. The longer it stands the greater the reduction.

#### MARKETS AND USES FOR TIMBER

Like everything else the uses of wood products depend on markets and the effect of markets on the forests is very much the same as the effect of markets on minerals. When lumber brings a high price, a lot of it is cut. When it is low, only the best is cut and the medium and poor is wasted. Today in the magnificent forests of the Northwest, a good 75 per cent of the timber is allowed to rot on the ground because at present only the very highest grade timber can be sold at a profit.

As far as the saving of the forests is concerned, the lumber companies are now caught in a vicious circle. They have invested a lot of money in land and machinery. The tax and fire protection expenses are high. At the same time, lumber does not bring a high price. This means that if the lumber companies are going to make enough money to keep going, they must cut more timber, and the more timber they cut, the more the market is flooded and the lower the price, and the lower the price the more timber must be cut, and so on.

One reason the market for timber has shrunk is the fact that so many wood substitutes have been developed. For instance, wood is no longer essential for construction purposes. Steel and concrete have taken its place.

To offset this, new uses for wood are now being discovered. For instance, a great many species of trees are now used to produce pulp for newspaper and fibre-board. In addition to this, scientists are also discovering ways to use wood waste. Sawdust at one time was thrown in great heaps beside the sawmill and burned in special converters built for the purpose. Today a certain amount of this sawdust is being pressed into blocks to be burned in fireplaces. Other sawdust is being made



into such things as wallboard. Lignin, a wood product, was once considered utterly useless. The Forest Products Laboratory of the United States Forest Service has discovered ways of turning this lignin into a valuable plastic which is strong, durable, and fireproof.

It is doubtful just what effect the discovery of new wood uses will have on the forests. Some people argue that new uses for wood mean more complete use of wood; that is to say, there will be less waste of wood. So long as new uses merely consume what was formerly wasted, this is true, but that is not always the case. For example, beside a large sawmill on the Columbia River, a pulp mill was built. This pulp mill was supposed to take the waste from the sawmill and turn it into paper pulp. However, it was not long before the pulp mill found that for technical reasons it was cheaper to make the pulp from logs. Now, instead of depending on waste, this pulp mill grinds up huge Douglas fir logs. This is just an example of how the use of waste products can become an added drain on forest reserves.

#### THE FOREST SERVICE

About one-fifth of the forest land of the United States is owned by the people. There are about a million acres of county, municipal and town forests and five million acres of state-owned forest land. The great bulk of publicly owned forest land belongs to the federal government. This is the 170 million acres in the national forests which contain about one-third of the remaining saw timber in the country.

The federal forest is managed by the United States Forest Service which is part of the Department of Agriculture. The principle of Forest Service management is called "multiple use." In simple terms, multiple use is the greatest number of uses for the greatest number of people. The chief use of federal

forest land is to supply timber and summer grazing lands, protect watersheds, provide recreation, and protect wild life.

### MULTIPLE USE

One major problem of the Forest Service is to see that the various types of land will yield the highest use value. In the Lake Tahoe region, for instance, there are a great many summer houses on forest land. It is also a region in which the Forest Service permitted sheep-grazing. The residents in the summer houses didn't like to have the sheep around. The Forest Service had to decide in that case which was the higher use, grazing or recreation. The people who had built the summer houses had

### THE ROLE OF THE FORESTS



*A forest is not merely a collection of trees. It serves many purposes. It protects the land, helps to support the balance of nature, and supplies us with valuable goods and human values.*

invested a considerable amount of money in them. On the other hand, the sheepherders depended on adequate grazing lands to earn a living. In the end the sheepherders were moved to another area.

Other problems of multiple use come from the necessity of deciding whether or not an area should be cut, saved for wild life and recreation, or turned into a wilderness area. The only

influence the public has on these decisions of the Forest Service is by direct protest to Congress. It is quite remarkable that the Forest Service has managed to keep such protests at a minimum and at the same time preserve and increase the productivity of the national forests.

For a discussion of the additional phases of Forest Service multiple-use, see page 165 for grazing, page 120 for watershed protection, and page 224 for Forest Service recreational areas.

#### WILD LIFE

The protection of wild life is primarily the duty of the state, since the state governments assume the ownership of wild life. However, within the national forests there are 400 wild-life and bird sanctuary areas.<sup>11</sup> These areas are administered by the foresters, although the animals belong to the state. The question of this ownership is one that has never been finally decided, and it is possible that the ownership of animals on federal land will be turned over to the federal government. In that case, the Forest Service will become a more important wild-life management agency.

A large part of the work of the Forest Service is experimental. Throughout the country they maintain experimental stations with qualified scientists in charge to study forest problems. At Madison, Wisconsin, in a great white modern building, the Forest Products Laboratory is housed. There scientists of the Forest Service attempt to discover new ways of using wood and methods of making more efficient old uses of wood.

The national forests may some day be the chief source of timber supply in the United States. The Forest Service is trying to find out how this timber supply can be put to its highest use and at the same time be preserved. The answer thus far has been sustained yield management. Every year the

<sup>11</sup> Report of Chief of Forest Service, *op. cit.*, p. 22.

lumbermen cut about twice as many more board feet than grow. This means that forest depletion is very rapid. The worst part of this is that the timber which is cut is practically all mature sound timber, while most of the growth is occurring in second-class timber. Douglas firs, redwoods, cypress, which take anywhere from one hundred to one thousand years to grow, are being cut, while the increased growth is adding to trees of inferior form or species. If the forests of the United States were on a sustained yield basis, the increase in growth would be somewhat greater than the amount cut.

The activities of the Forest Service are an example of successful bureaucratic administration within a democracy. This success was due primarily to an extraordinarily efficient and well-chosen personnel. However, another reason for the success of this type of administration in this instance is the fact that the Forest Service is managing government property. This property, unlike most of our other land resources, is a reserve. In deciding which form of government is best to administer the various resources of our land, it is always necessary to think of the use of that resource. The type of government best suited for that resource is frequently determined by the direct economic importance of the resource.

The national forests are not the primary source of income for any considerable number of people. Consequently, the number of people directly dependent on the regulations laid down by the Forest Service is much less than those who are affected by the Agricultural Adjustment Administration, for instance. As an agency of government, the Forest Service is a kind of policing organization appointed to protect the property of the nation. The Agricultural Adjustment Administration, on the other hand, is an agent of the individual land users. It cannot act without the consent of the people who are directly affected by it.

In the future, the national forests will become more impor-

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4. If you were a forester in the United States Forest Service in charge of a national forest in the Rocky Mountain region,

how should you plan to use that forest? Remember that the main idea of Forest Service is "multiple use."

5. How are the forests in your state protected from fire? Find out if the state makes any effort to encourage people to cut their timber wisely.

#### DEBATES

1. Would the control of all the forests of the United States by the national government be a good plan?
2. Is sustained yield management the most profitable system for owners of large tracts of timber?
3. Which one of the forest taxation plans mentioned in the chapter will best promote good forest management?

CHAPTER SIX

LAND FOR  
WILD LIFE AND RECREATION

Six days of severe traveling have brought us from the Comanche village to the north bank of the Canadian, where we are snugly encamped on a beautiful plain, and in the midst of countless numbers of buffaloes; and halting a few days to recruit our horses and men, and dry meat to last us the remainder of our journey.

"The plains around this, for many miles, seem actually speckled in distance, and in every direction, with herds of grazing buffaloes; and for several days, the officers and men have been indulged in a general licence to gratify their sporting propensities; and a scene of bustle and cruel slaughter it has been, to be sure! From morning till night, the camp has been daily almost deserted; the men have dispersed in little squads in all directions, and are dealing death to these poor creatures to a most cruel and wanton extent, merely for the pleasure of *destroying*, generally without stopping to cut out the meat. During yesterday and this day, several hundreds have undoubtedly been killed, and not so much as the flesh of half a dozen used. Such immense swarms of them are spread over this tract of country; and so divided and terrified have they become, finding their enemies in all directions where they run, that the poor beasts seem completely bewildered—running here and there, and as often as otherwise, come singly advancing to the horsemen, as if to join them for their company, and are easily shot down. In the turmoil and confusion, when their assailants

have been pushing them forward, they have galloped through our encampment, jumping over our fires, upsetting pots and kettles, driving horses from their fastenings, and throwing the whole encampment into the greatest instant consternation and alarm."<sup>1</sup>

This account of buffalo slaughter was written by George Catlin, who toured the Indian country of the West between 1832 and 1839. Originally, the buffalo roamed over most of what is now the United States. Father Hennepin found them in the Great Lakes country in 1679. A half century later, Colonel William Byrd's party came on buffalo when they were surveying the boundary between North Carolina and Virginia.<sup>2</sup> In Pennsylvania there is a town named New Buffalo, because it supposedly marks the spot of a buffalo ford across the Susquehanna River. In 1871 there were supposed to be about 5,000,000 wild buffalo left in the United States. Eighteen years later that number had shrunk to about 285. And eighteen years after that only a small part of these were left, all of them in Yellowstone National Park.<sup>3</sup>

The buffalo disappeared like snow in a summer sun. The Indians depended on the buffalo for food and clothing. As Walter P. Webb wrote, "The buffalo and the Plains Indian lived together, and together passed away."<sup>4</sup> Before the coming of the white men, there had been so many buffalo that the Indian hunts had no effect on their number. But the white men felt differently about them. They enjoyed riding into the great herds and shooting them for the fun of it. There are accounts of men shooting buffalo from the windows of moving trains. If they were good shots, the bodies would be left behind for the coyotes to eat. Many thousands were killed to supply skins out of which to make the famous buffalo robes which at

<sup>1</sup> Catlin, *op. cit.*, p. 86.

<sup>2</sup> Webb, *op. cit.*, p. 43.

<sup>3</sup> Report of National Conservation Commission of 1909, Vol. III, p. 319.

<sup>4</sup> *Op. cit.*, p. 44.



one time could be found in nearly every eastern middle-class house. At about the time Catlin wrote, the American Fur Company was shipping 70,000 of these robes east every year.<sup>5</sup>

There was another reason that made the rapid decline of the buffalo inevitable. As the cattle ranchers, and, later, the farmers advanced across the plains, they took up the buffalo's range land for their cattle and farms. Even if the hunter and fur trader had not previously killed off the buffalo, the rancher and farmer would have destroyed their range and thus paved the way for mass starvation.

The importance of this account of the buffalo is that it is typical of the fate of a great deal of American wild life. Originally the trout and beaver and wild turkeys and all the other native kinds of wild life were restricted only by their natural enemies, the food supply, and the occasional hunting of the Indians, who ate them or used their pelts for clothing. The first white men who came to this country used the wild life in much the same way. But there was one important difference. In addition to supplying food and clothing, the white man looked on wild life as a source of income. The Pilgrims said they "hoped to pay the way of the Lord in fish."<sup>6</sup> By 1731 the manufacturing of beaver hats was a flourishing industry in New England and New York.<sup>7</sup> The annual value of furs shipped from the British colonies in America to England was well over £200,000.<sup>8</sup> One of the most thorny points to settle after the Revolution was the turning over of the fur trading posts in the Northwest to Americans. In many cities great fortunes, such as that of the Astor family, were built on the fur trade. Today the annual value of fur taken from wild

<sup>5</sup> *Prairie and Rocky Mountain Adventures*, by John C. Van Tramp—H. Miller, Columbus, Ohio, 1860, p. 411.

<sup>6</sup> Andrews, *op. cit.*

<sup>7</sup> Faulkner, *op. cit.*, p. 149.

<sup>8</sup> *Ibid.*, p. 88.

animals in America amounts to \$60,000,000,<sup>9</sup> while the value of fish caught is \$107,000,000.<sup>10</sup>

With the exception of these two classes of what might be called commercial wild life, the major use of such animals is to provide recreation. The fact that much of the hunting and fishing in the United States has become a sport rather than a business is a key to what has happened to our wild life.

#### WILD LIFE AND THE LAND

As the white man took over the land in America, he simply destroyed everything that stood in his way. As we have seen, he cut down the forests, turned over the prairie sod, dammed the streams. When, for instance, certain animals like the wolf, the deer, the bear, the wild-cat, and the mountain lion interfered with the rancher's livestock, he hunted them out and killed them. Indeed, in many parts of the country, this hunting of so-called "destructive" game is still going on.

The spread of agriculture in America affected wild life in two different ways. The clearing of the land destroyed the cover and feed of many types of game. The killing of the animals which did not fit into a farming community upset the balance of wild life.

When we talk about the balance of wild life, we mean the delicate relationship between animal food supply and animal population. Wild animals depend either on plants, insects, or other animals for their food. A deer browses certain bushes. The mountain lion feeds on the deer. If the browse plants are destroyed, the deer starve, if they cannot find substitutes. If all the deer starve and there is no other suitable animal for food, the mountain lions starve.

If you reverse this process and kill the lions, then the deer multiply very rapidly. This large population exhausts the supply

<sup>9</sup> Van Hise and Havemeyer, *op. cit.*, p. 420.

<sup>10</sup> *Ibid.*, p. 472.

of browse plants, and starves. No matter whether you upset the balance by taking away the browse plants or the lions, you get the same result. This is a very simple way of stating a complicated process. Here is an example of what actually happened in the Southwest.

In 1905, Uncle Jimmy Owens went into the Kaibab Forest in Arizona as a lion hunter. For each lion killed he received a bounty from a grateful government which wished to be rid of such beasts. In a few years Uncle Jimmy killed several hundred of these animals, chiefly along the North Rim of the Grand Canyon.<sup>11</sup> A few years later the Kaibab was made into a game preserve. The chief result of these two attempts at game control was a huge increase in the number of deer on the Kaibab Forest. Indeed, the deer increased so fast that they soon destroyed 40 per cent of the winter feed. With the winter feed gone, hundreds of deer starved to death. It was simply another case of overgrazing, with all of the bad effects that come with overgrazing in the Southwest. It is estimated that it will take fifty or more years to bring the vegetation back to a healthy state.<sup>12</sup>

Hunters like Uncle Jimmy were commissioned to kill mountain lions and grizzly bear not only to protect the deer and elk, but also to save the stock of the ranchers from night raids by these preying beasts. But once the deer and elk were freed from their natural enemies, they multiplied very rapidly.

With so much of the land which was once winter range for the deer and elk now taken up for feeding beef cattle, there is a shortage of food in the winter for these animals. During severe winters when there is so little to eat in the higher altitudes, great herds of deer and elk come down on the lowlands. The stock raisers naturally do not want the deer eating the

<sup>11</sup> *Grand Canyon National Park Bulletin*.

<sup>12</sup> Parkins and Whitaker, *op. cit.*, p. 495.

winter range of their cattle. The period between fall and spring is the most critical time on a cattle ranch, for then feed is scarce.

This is another illustration of the problem of keeping the balance in land use. The stockmen have taken the winter feeding ground from the deer. The deer have been forced to overgraze the higher summer feeding grounds which the stockmen also need for their cattle in the spring and summer. In addition to this, much of the winter feeding ground for deer has been so badly overgrazed by the cattle that it is useless for any purpose.

The result of this is a severe competition between cattle and wild life such as the deer for the forage. Man, deer, and cattle depend on the forage, and the forage is being destroyed by overuse.

#### WILD LIFE AND FOREST LAND

On forest land the problem of wild life is once again a matter of balance. The beaver, for instance, was once a valuable engineer in the headwaters of the great river systems. His dams helped to hold back the torrents in flood seasons. But most of the beaver which once lived in the forests have long since been made into ugly, stove-pipe beaver hats or fur coats.

The story of the deer and elk in the forest is much the same as the story of these beasts on the farm and range lands. The destruction of their natural enemies leaves too many deer and elk for the food supply. To add to the threat of starvation is the fact that hunting laws in some states have gone from the extreme of leaving wild life unprotected to the other extreme of giving too rigid protection.

A practical example is the case of the Pecos herd of elk in the Santa Fe National Forest in New Mexico and the Sitgreaves herd in the Sitgreaves and Coconino National Forests in Arizona. The state restricts the hunting of these animals. These restrictions were placed on the herds when they were first introduced in small numbers and were in danger of being

hunted out of existence. And such laws were once necessary. In 1913 there were but seventy-five elk in the Sitgreaves herd, and about eighteen in the Santa Fe herd in 1915. Today with this state protection the Sitgreaves herd has grown to about 3,300 head and the Santa Fe herd to about 1,100. From the point of view of those who wanted to save the elk, this is fine. But the Sitgreaves herd lives in an area where there is food for but 2,000 head of elk, and the maximum that should be in the Santa Fe forest is 1,000.<sup>13</sup>

#### WILD LIFE AND WATER

Just as the westward movement of people destroyed the native homes of the deer and other animals, the growth of agriculture, particularly in the upper Mississippi region, destroyed the important stations along the traditional migration routes of the waterfowl, which are called flyways. Swamps, lakes, and river areas provided shelter and food. The swamps were drained to make fields, many of which never paid the cost of drainage. Pollution destroyed much of the natural food. And on top of these troubles, the increased number of hunters cut a deep hole in the ranks of the migratory birds.

Another problem arose when oil became widely used. On the flyway that follows the east coast, ships throwing out the sludge from their oil tanks would leave the water coated with a kind of slime out of which a wild duck or goose could not rise if he should chance to light in it. Then in the oil fields themselves, some of which lie in the central flyway, pools of waste oil collect, drain into swamps and other bird waters, and catch the unwary birds.

The Klamath Lake region in northern California and southern Oregon had once been a great nesting ground for ducks and geese. When the Pacific Coast land boom got under way, it was decided that the Klamath Lake should be drained. The federal

<sup>13</sup> *The Western Range*, p. 352.

government, through the Bureau of Land Reclamation, undertook the job, and in a short time half the lake bottom was ready for the farmers. But there were no farmers. The land boom had collapsed, the Klamath nesting ground for ducks had been reduced to a mere fraction of its former size. Now the federal government is trying to restore some of the lake that has been drained.<sup>14</sup>

Just how important this water is to the waterfowl you could see if you should take a Southern Pacific train from Portland to Dunsmuir, California. The track winds along the shore of the lake, and as the train chugs along, great shoals of birds rise from among the reed beds, or streak out from the shore to free water like so many torpedoes.

There are many other areas located along the flyways which have for one reason or another been destroyed for the birds. For them it has been as disastrous as if a great oasis of the Sahara like Timbuktu should suddenly become a drifting sand dune. Just now a program of restoring these migratory bird oases is getting well under way. Most of this work is being done by the federal government, and it is being carried out by the Biological Survey in the Department of Agriculture.

#### MARINE WILD LIFE

The salt water fish is a good example of wild life used as a commercial resource. At one time the fresh water fish were also a commercial resource; but today, with the exception of the fish caught on the Great Lakes, their primary use is to provide recreation. For that reason, the problem of the fresh water fish is different from that of the sea fish.

So far as the salt water fish, such as the cod and halibut, are concerned, the problem is chiefly not to catch too many. This is also true of the shallow water fish such as the mackerel and swordfish. These are the most valuable of the sea fish; and since

<sup>14</sup> National Resources Board Report, *op. cit.*

they are such popular table delicacies their numbers have been rapidly decreasing.<sup>15</sup> However, the salt water fish depositing their eggs in fresh water have been most severely depleted. They reached their peak production before 1897 and have been declining ever since.<sup>16</sup> As a result of this overfishing, we must now depend for food on fish that formerly were considered useless.

In addition to overfishing, man has endangered this valuable food resource in another way. Shrimp, oysters, and lobsters, which live in the shallow waters near the shore, are affected by the streams which flow into the sea. These streams have become polluted with industrial waste and sewage. This waste destroys the food supply and poisons the fish.

Human interference with rivers has another influence on fish which live near the shore or depend on fresh water for spawning grounds. Even though the water which flows in the stream may be pure, if the volume of the stream is greatly reduced by water being drawn off for irrigation, the fish may be unable to reach the spawning ground. In addition to this, when little fresh water flows from the mouth of a stream, the percentage of salt water at the mouth becomes so strong that the enemies of shrimp and oysters can come into this border zone and destroy them.

There is another problem raised by man's use of rivers. Some salt water fish, particularly the salmon, spawn in fresh water. In many cases the dams built for power and irrigation block their route to the spawning grounds. On the Columbia River, the building of Bonneville Dam has raised a more serious problem. The salmon is the most valuable fish caught in American waters. It has been greatly overfished; but even today, when the salmon are running up the rocky gorges of the upper branches of the Columbia River, you could stand on the bank like the Indians, and spear fish all day. But what will happen when the new

<sup>15</sup> Van Hise and Havemeyer, *op. cit.*, p. 476.

<sup>16</sup> *Loc. cit.*

dams on the Columbia are operating? The federal government has spent \$6,550,000 building fish ladders which it is hoped will enable the fish to pass Bonneville Dam, and special screens have been installed to keep the young fish returning to the sea out of the turbines. Some people have objected to this expenditure. They claim the salmon will never get up as far as the dam. They believed that the fish will be killed by the waste from the pulp mills along the lower reaches of the river.

For the fresh water fish such difficulties have been a near disaster. In all of the United States the rivers have been the main areas of settlement. Man has used them for water power, electric power, drinking water, irrigation, and to dispose of the waste of his cities and factories. Every one of these uses has in some way destroyed either the food or oxygen supply in the water, or the natural lanes of fish migration.

#### CONTROL OF WILD LIFE

Wild turkeys, deer, pheasant, trout, and other species of wild life provided special delicacies for the early settlers of America. Today venison steaks and broiled brook trout are the reward of successful hunters who try their luck but a few weeks of the year. The reason for this is that the wild life population has been so reduced by overhunting that it must be protected by laws if it is not to disappear altogether.

Originally there was a considerable body of hunters who bagged game for a market. These men who killed game for a living used any means that would enable them to get their quarry—traps, snares, and so on. Sportsmen and game conservationists were aroused by these methods, but too late, unfortunately, to save the passenger pigeon, a most beautiful American game bird, and the heath hen, another native American species.<sup>17</sup>

As early as 1813 the Fowling and Fishing Association of

<sup>17</sup> Van Hise and Havemeyer, *op. cit.*, p. 401.



the Upper Township of Cape May County was incorporated in New Jersey. This was a private organization to protect wild life. As the game disappeared, similar sportsmen's organizations spread rapidly and grew strong. They sponsored educational programs to save wild life and put pressure on the states to set up official wild-life agencies. In many cases they assisted the state game departments to restock streams and game ranges.

The fact that a desire to restrict the hunting of game largely grew out of sportsmen's organizations indicates the change which has come over the American people, who had come to this country with the belief that the wild life should be free to all who wanted to take it.

Partly as a result of this pressure, the various states have set up fish and game commissions to protect the fish and game within their borders. The primary duty of these commissions is to administer the laws restricting the taking of fish and game, and to attempt to build up the wild-life population. Many states like Pennsylvania and New York have state fish hatcheries where fish to stock fished-out streams are raised. These various state commissions also have educational programs which are designed to make people use the wild life in such a way that it will not be exterminated.

State game laws have many bad loopholes. They rely mainly on such devices as long closed seasons and a limitation on the number of animals, game birds, or game fish that may be taken in a day or season, supplemented by much useful activity in restocking streams and game ranges. The real problem in game management, however, is to restrict the annual "take" of any species to the annual increase, allow for natural losses, and to provide abundant food and cover. Closed seasons and bag limits are a crude tool to achieve this end.

Many European countries restrict the number of hunters and the amount of the "take" so accurately that, in central Europe, for example, there is a very great amount of game in a

densely populated region. In a democratic country it is difficult to restrict the number of hunters, as everyone claims the right to hunt. Extra measures must therefore be taken to keep up the game supply.

In some states, like Iowa, farmers and sportsmen are coöperating to increase the game supply and restrict hunting to the annual increase. If the Forest Service succeeds in its claim to regulate game in the National Forests, it will no doubt work toward restricting the annual "take" to the annual increase. As the National Forests cover about 8 per cent of our land area and contain most of the best of our big game ranges, this possibility is of the utmost importance.

In addition to the educational programs and the bag limit laws, the states and the federal government developed another method of saving wild life. State and federal wild-life refuges were created to provide game with a safety zone in which they would be able to develop. This is a change from the earlier wild-life programs, which were designed to restrict the killing of game. With the exception of the planned killing of preying animals like the wolf and the mountain lion, there was little attempt to "manage" game.

Game management means to work out a method which both limits the kill of game and at the same time controls the numbers. Game management is in many ways a sort of land management in that one of its main objects is to provide sufficient food and shelter. It is a shift from a crude effort at regulating the number of game animals killed to a systematic control of wild-life environment in order to maintain a natural balance.

So far as wild life is concerned, this shift is best illustrated in the change in the Biological Survey's attitude toward predatory animals. Under the first phase of the conservation movement, the Biological Survey was chiefly interested in destroying those animals which killed other animals for food. Until quite recently the Survey had fifteen or more hunters on its pay roll

for every scientific investigator. The hunters concentrated particularly on those wild animals which preyed on livestock, poultry, and game. Thus the grizzly bear and the puma or mountain lion are today almost extinct.

We have already discussed the effect of this program. Today the Biological Survey has given up this policy. Take the deer again as an example. On overpopulated areas hunting restrictions are being removed so that the deer population can be decreased to a size which can be supported on the available supply of food.

#### LAND USE AND WILD LIFE

The major part of the new conservation program of the Biological Survey is the harmonizing of wild-life and land-use requirements. Primarily, this program is an attempt to restore something of that balance between game and the land which existed before the spread of agriculture in America.

About 11,500,000 acres of land have been taken out of other uses and turned over to the purpose of aiding wild life. Most of this was sub-marginal land on which farmers were vainly trying to make a living. This land is now used to provide three classes of wild-life refuges: (1) waterfowl or general wild life refuges; (2) big-game refuges, preserves, or range; (3) special refuges or rookeries for colonial non-game birds.

You can see how such a program fits into the plan of the Soil Conservation Service to retire sub-marginal lands. Indeed, all of the water programs, land improvement programs, and soil conservation programs fit into the new program for wild-life development. The building of water holes for stock by the Grazing Division of the Forest Service, or the Soil Conservation Service means that the migratory waterfowl for which the Biological Survey cares have new nesting and feeding grounds. The planting of cover crops and shelter belts of trees in the plains country both provide feed for wild life.

This illustrates one important point about land use. Every part of land use is geared to every other part. What destroys the soil, destroys the rivers, wild life, and finally the social institutions of men. If you build up the soil, the flood problem will be lessened, land users will have a more stable life, wild life will have food and cover. The use of the land is like balancing weights on a scale. If one of the weights is changed, the scale is out of balance. If one factor of land use, the forests, for example, are mismanaged, the whole problem of land use is out of balance.

#### HUNTING LAWS

Since the migratory birds, like the wild duck, are under the jurisdiction of the Biological Survey, the Survey sets the limits of the hunting season and the number of birds each hunter may take throughout the country. This is the only case in which the Biological Survey has such power, but it illustrates the problem of evolving fair hunting laws.

The Biological Survey gets reports from the various regions through which the waterfowl pass. Most of this reporting is done by four of the Survey's flyway biologists who follow the migration from Canada to Mexico. From these reports the Survey determines how many birds there are and how many can be shot without endangering the survival of the species. The next problem is to find a hunting season which will be long enough to satisfy the hunters, and short enough to save the ducks. The Survey in 1936, for example, said that there could be thirty continuous days of duck shooting. These thirty days were any period within which the ducks would be passing through the state concerned.

Some hunters objected to a thirty-day consecutive season for their state on the grounds that the state was too big. In Arizona, for example, many hunters would like to have one season for the northern part of the state, when the ducks are

there, and a later season for the southern part of the state when the ducks come down there.

The Biological Survey believes that the division of the season within the various states would be bad for ducks and complicate the problems of enforcement. Hunters would go to the area where the season opened first, kill the limit, then move to the area where the season opens later and get a second limit.

The point of the controversy is that the Survey is primarily interested in perpetuating waterfowl, while the hunters, as a Congressman put it, “. . . have no objection to the laws we have at the present time [regulating shooting], provided we can in some way have some opportunity to kill a few ducks once in a while.”<sup>18</sup>

#### INTERNATIONAL REGULATION OF WILD LIFE

The management of waterfowl illustrates another point in the problem of wild-life control. They are a kind of international wild life. These birds migrate from the north to the south and back again during the year. Many of them spend the summer in Canada and the winter in Mexico, and much of the time between in the United States. To protect these birds from being destroyed, two Migratory Bird Treaties were adopted. These are agreements between the United States, Canada, and Mexico guaranteeing that while these migratory birds are within the borders of these three nations, they will not be destroyed. In the United States the administration of this law is up to the Biological Survey. This is an interesting exercise of the treaty-making power of Congress. It was doubtful whether Congress had the constitutional right to interfere directly with the police powers of the states. The Constitution, however, makes treaties a part of the supreme law of the land; and it was under this power, with the later approval of

<sup>18</sup> *Ibid.*, p. 13.

the Supreme Court, that Congress exercised a police power usually left to the states.

In order to protect these birds in the United States according to the treaty terms as they fly from one home to the other, the Migratory Bird Act was passed by Congress. This law regulates the seasons during which the birds may be shot and the numbers that may be shot. It also authorized the establishment of bird refuges in certain parts of the country. These refuges, which now cover about 4,500,000 acres, are nesting and breeding grounds, such as marshes, lakes, and swamps, spaced at intervals of about one duck-day's journey, along each of the four main bird flight routes that span the United States running north and south. Migratory birds, like the airliners, fly regular routes, routes which they have followed for thousands of years, routes which were apparently selected because there were good natural breeding and feeding grounds along them.

More of an international problem is the regulation of fish. With the exception of the fish caught within the three-mile zone around our coast, the fish belong to whoever catches them. However, it is easy to see how this haphazard method can cause endless complications. For that reason the United States government has signed treaties with other nations whose fishermen depend on the same supply that is used by Americans. Canadian fishermen use the Grand Banks just as much as our Gloucestermen. Japanese seal fishers depend on the seal supply which originates in the Pribilof Islands. In order to maintain a regulated use of these resources, and keep order between the various groups of fishermen, the treaties lay down certain rules. The Bureau of Fisheries and the Coast Guard administer these rules for the United States. The outstanding success of this type of regulation has been the preservation of the seal. Before seal hunting in Alaskan waters was regulated, the seal hunters were rapidly destroying the herds. Now with very strict con-

trol of seal hunting, the seals have been saved from extinction. They furnish a large annual crop of pelts. The proceeds from the sale of these pelts is divided among the various contracting nations on a proportional basis.

#### CONTROL OF WATERWAYS

To protect the fresh water fish, the main thing is to control the streams. Both navigable streams and their tributaries are under the control of the federal government. The states, however, claim the right to the fish in the streams. The federal government controls the right to build dams or do anything else that might affect the passage of boats. Except in special cases, no one controls the pouring of sewage and industrial waste into streams. These special cases are usually connected with one of the various state compacts such as the Colorado River State Compact or the Port of New York Authority. The major point of these agreements is usually something far removed from the issue of the preservation of fish. It may be water conservation, or sewage disposal, or the protection of navigation. However, somewhere in these agreements there may be a clause protecting the wild life. And even if there were no such clauses, these compacts are primarily ways to use water wisely, and that wise use is a help to the fish.

#### THE BUREAU OF FISHERIES

The Bureau of Fisheries investigates methods of preserving and increasing the supply of valuable food fish.<sup>19</sup> Thus it was the Bureau of Fisheries that established a halibut fishery on the Pacific Coast. Previously the halibut had been an Atlantic Ocean fish, but after investigating the market and the natural conditions in the Pacific, the Bureau's scientists decided that such a project would be successful and "planted" the halibut. It administers the salmon fisheries of Alaska and the fur seal

<sup>19</sup> Van Hise and Havemeyer, *op. cit.*, p. 399.

herd of the Pribilof Islands and the sponge fisheries off the coast of Florida.<sup>20</sup> In a great many ways the Bureau of Fisheries is a marine department of agriculture. It administers the regulatory laws of Congress, conducts scientific investigations of the various fish, and keeps an eye on the fish market. Indeed, one part of the work of the Bureau of Fisheries is to further good practices of what is called aquiculture. Aquiculture is fish farming, just as agriculture is the growing of plants. As the various valuable species of fish are depleted, aquiculture becomes increasingly important.

#### THE VALUABLE FUR BEARERS

The business of hunting fur-bearing animals such as the muskrat and beaver, has, like most other businesses, become a highly systematized process. True, a great many pelts are still sold by farmers who do a little trapping in their spare time, but today most pelts come from farms where animals are especially grown for their coats.

A generation or so ago California was a great hunting ground for fur trappers. Under the snow crest of Mount Shasta were huge forests where hardly anyone but trappers and a few prospectors ever cared to go. Today Mount Shasta's flanks have been cut bare of their evergreen forests. In the place of the Douglas fir, Ponderosa pine, and incense cedar, there are gray patches of dry volcanic soil showing through the cover of creosote brush, rabbit sage, and other bushes. And at its foot is a large area enclosed by a high fence. On the fence is a sign announcing that here is a silver fox farm. The farm has failed, too, now, but it would have been hard to tell any trapper of seventy-five years ago that there would be farms to raise fur on the sides of that great peak.

If you drive out to the east from New Orleans, you pass through low green flats by the side of the Gulf of Mexico. To

<sup>20</sup> *Loc. cit.*



the average person they are just salt marshes. But even the average person would notice that the vegetation is unusually heavy. There is a reason for this. This region is a huge muskrat farm. The flats are frequently burned over to produce better cover for the muskrats. Then in the trapping season, the trappers of the big companies which own these marshes catch the muskrats and take their pelts. These farms are one reason why Louisiana is the largest fur-producing state in the Union.

The regulation of these farms is primarily a problem of the states. State laws are passed to protect the species farmed. At the same time, the Biological Survey assists these fur farmers just as the Bureau of Animal Husbandry helps the stock raisers. They experiment, investigate, and attempt to discover better and more profitable methods of fur farming, and then pass this information on to the fur farmers.

In most cases, the management of commercial wild life is now on a sound basis. Men who sell furs and fish have a big stake in the resource that supplies them. They are usually willing to attempt and aid some sort of control.

This is not the case for wild life that does not supply a commercial market. The problem of control is confused by the demand for hunting rights, the competition between livestock, farmers, and wild life for food, and the fact that it is difficult to set up satisfactory laws in forty-eight states to manage a resource that does not know the meaning of state boundaries.

Most people believe that the solution lies partly in the better policing of wild life by the states, and this means that the states must be willing to enact and enforce more stringent or better balanced regulations restricting the shooting of game. At the same time, they will also have to be willing to spend much more money than in the past to restock areas that have been shot out, and to provide food and shelter in regions where the natural food and cover has been destroyed. Above all, both the states and the federal government will have to work out

flexible methods of game management that will restrict the numbers of wild life to the available food. At the same time the animal kill must be controlled so that it does not exceed the annual increase.

#### RECREATION LAND

With the exception of certain kinds of fishing and fur farming, all other forms of hunting wild life come under the head of recreation. But the protecting of wild life for the hunters is only a small part of the management of land for recreation undertaken by the various departments of government.

The most famous of recreational areas are of course the great National Parks which are administered by the National Park Service of the Department of the Interior. When most people think of these federal parks, they have in mind some place like Yellowstone or Yosemite. Actually there are twenty-six national parks, two national historical parks, eleven national military parks, sixty-seven national monuments, ten battlefield sites, eleven national cemeteries, and four miscellaneous national memorials.<sup>21</sup> All of these are under the National Park Service. In addition to these, there are under the National Forest Service of the Department of Agriculture special types of forest areas especially suited for recreation. There are: (1) superlative areas, that is, areas of superlative beauty; (2) primeval areas—regions which have been unchanged by man; (3) wilderness areas; these are wild areas with a few roads but no improvements or buildings of any kind; (4) roadside areas; (5) camp site areas; (6) residence areas, and (7) outing areas.<sup>22</sup> Finally, there are certain lands owned by the federal government, such as the Navajo Indian Reservations in Arizona and New Mexico, which are visited by many people every year

<sup>21</sup> Statistical Table—*Areas Administered by the National Park Service*.

<sup>22</sup> National Resources Board Report, *op. cit.*, p. 147. Municipal and County Parks in the United States 1935. United States Gov. Printing Office, Washington, 1937, pp. 558, 559.

because of the magnificent scenery and the picturesque life of the Indians.

Besides the federal parks, there is an area of 6,877 square miles in state, county, and municipal parks.<sup>23</sup> This brings the complete total of land in park areas in the United States up to 31,083 square miles.

Primarily the major use of this land is to provide recreation. But different kinds of people like different kinds of recreation. Thus there are many different kinds of parks. The big national parks and monuments are areas of remarkable beauty which have been set aside to be preserved for all time. Other parks, national, military, and historical monuments like Gettysburg, Pennsylvania, and Morristown, New Jersey, have been selected because they played an important part in history. The Forest Service areas are developed on a different basis. While the Park Service regions have been selected by boards of experts and set aside and developed, the Forest Service recreation areas have grown up as a result of the demand for camp grounds.

This difference in origin has caused a great difference in the type of recreation area developed by the two services. The National Parks are highly organized regions. The Forest Service camp grounds and other areas are simple places to which people can go and stay in camps. In addition to this, the Forest Service has set aside certain areas in which people are permitted to build summer houses.

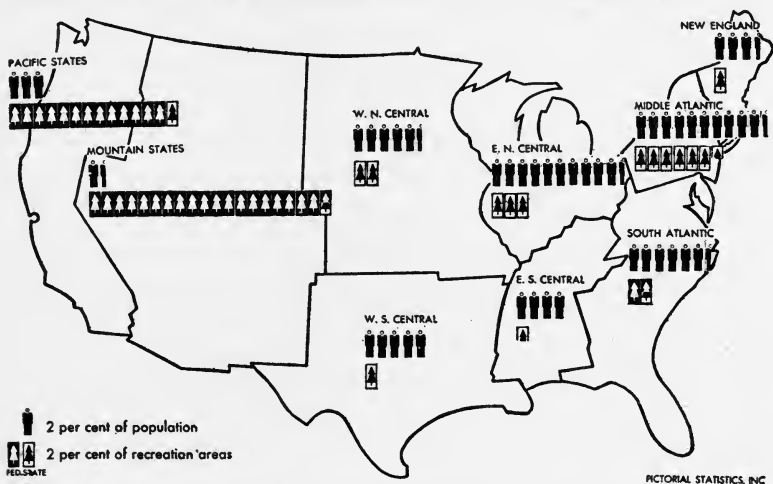
Both the Forest Service and the Park Service permit people to set up private businesses in the various recreation areas. The difference is that in a national park these private enterprises are often very elaborate. They include everything from hotels like the Ahwahnee in Yosemite where the rates begin at \$12 a day, to pack horse outfits, sightseeing busses, and so on. In the parks, there are specialists who give lectures explaining the

<sup>23</sup> A List of State Parks and Related Recreational areas of the United States, Jan. 1, 1937, p. 4.

wild life, geology, and the many other outstanding features of the park. The Forest Service areas usually have a few simple facilities and a few forest rangers at most who are responsible for order in the recreation areas and who give help to the campers when they need it.

Most municipal, county, and state parks are much smaller than the federal recreation areas. Frequently they are simply

#### FEDERAL AND STATE RECREATION AREAS AND POPULATION



*The problem of recreation in America today is to make up the deficiency of recreational land in our heavily populated areas.*

picnic or camp grounds, although some states have set aside historical sites, forests, and very beautiful regions as parks. The administration of these state, county, and municipal parks is usually a matter of keeping the parks in presentable condition.

The great problem of recreation is to have sufficient recreation areas within the reach of the majority of the people.

By chance, the greatest population is concentrated east of the Mississippi River, while the largest and best public recreation areas are west of the Mississippi. Most of the national

parks are in the West; all but eight million acres of national forest land are also there. This means that there is a great need for more recreational land in the East. Many of the areas which are unsuitable for national parks or forests must be developed as state, county, or municipal parks. Michigan, Pennsylvania, and New York have spent a lot of money and effort doing this. Also considerable sub-marginal land retired from cultivation has been developed for recreation. However, there are still large sections of America without any available public recreation area to which the people can go.

Even in the West, particularly in southern California, the available recreation land is too small. It is estimated that the Angeles Forest near Los Angeles has 3,744,418 visitors a year. So far the only solution seems to be to develop lands which, although beneath national park standards for beauty, and national forest standards for timber, would be at least usable as recreation grounds. One great advantage of these would be that they would reduce the terrific pressure on the national parks, which are now greatly overcrowded.

In simple terms, the first problem of parks is that there are not enough parks in the areas of high concentration of population. The second problem is that in many of the parks set aside because of their spectacular beauty there are such crowds of people that the general effect is more that of an amusement park than of one of the great scenic areas of the world. The third problem is money. Even if the national parks were near the great population centers, and if there were enough national parks so that their scenic wonders were not lost in the crowds, they would not meet the recreation needs of the country if the majority of the people could not afford to go to them.

There are two sides to this money problem. First, there is the problem of cost to the visitor. Forest Service recreation areas are for the most part free. You could camp on the western

slope of Mount Hood, for example, for nothing. Even the fire wood is supplied free. The camping arrangements would be practically perfect. A recreation area like this, with its well-laid-out grounds that are neither too elaborate nor too rugged, is very suitable for those who have a small income and like to camp. There are swimming pools, wading pools, sand boxes, community kitchens and dining rooms, proper toilet facilities, well-constructed parking spaces, individual camp fireplaces, all so arranged that the camper can feel alone and yet close to company if he wants it. This is an ideal recreation area near a large population centered around Portland, Oregon. Unfortunately, there are not many Mount Hoods.

For those who have more money to spend, there are trails through the forests for pack trips. Special lands are set aside for those who want to build permanent summer camps in the forests. Such buildings can be built only by those who are able to invest several hundred dollars for such a permanent summer house.

About 60,000,000 people visit the national forests in a year. Most of these just drive through a section. About 17 per cent stop and camp. Practically all of this is in the Far West. The national parks, on the other hand, draw about 15,000,000 people a year. When people visit forests they are frequently on their way to some other place. The visit to the forest is simply a side trip. When people go to national parks, they go with the express idea of seeing the park.

Once you are inside the park, you can camp in the public camping ground, stay in a tourist camp, or take a room at a hotel. In the parks, all of the activities except the actual management of the park itself are controlled by private companies. These companies run the hotels, stores, camps, transportation, park trips, and so on. The government requires these companies to meet certain standards. The buildings must be safely con-

structed and clean. The rates charged are limited so that the operator can earn no more than a set amount of profit.

The rates charged by the private operators in the parks determine in a large part the extent to which the citizens of the United States can use the parks. The aim of the Park Service is to provide accommodation for both rich and poor. However, in some parks, the cost of living in all but the lowest type of accommodations is more than the average person can pay. Many of these average people would be unhappy in the one type of quarters they could afford in a park. Thus the use of the parks is to a certain extent restricted to those with a larger than average income.

There is another side of the financial management of parks. Many parks, like Yosemite, were originally state parks which were later turned over to the Department of the Interior. In turning over the rights to the park the states also turned over the rights to tax property in the park. In Yosemite there is invested \$5,000,000 of private capital. The owners of these investments pay no taxes in the county, which once included the park, or to the state of California. Their only taxes are paid to the federal government. This means that the country which once collected the taxes from this land now has less revenue.

Take Yosemite as an example of another way in which the county lost revenue. Recently a large tract of sugar pine was taken over by the park. This tract of sugar pine had been in a national forest. Under Forest Service regulations, a certain portion of this timber was cut each year and sold, and one-third of the revenue of this sale was paid to the county for schools and roads.

Those who favor the present system say that after all, the tourists coming to see the sugar pines will spend more money in the area than would have been made in taxes. This increase in tourist trade will offset the loss in taxes. Those who argue on the other side say that most of this tourist money is spent in the

park, and therefore gives no revenue to California. And the extra money that is spent going to and from the park is spent in the towns. It increases the income of the storekeepers, but it does not add much to the tax revenue which all the residents must pay.

A park is created by an act of Congress and the people have a chance to express their opinion of the system through their congressmen. But once the park has been created, it is under the Department of the Interior, which is administered by appointed rather than elected executives. It is possible for Congress to change the rulings of the Park Service, but it is very unlikely that any change would be made to satisfy or correct purely local conditions. In other words, although in the final analysis the people through Congress do control the Park Service, practically it operates as an independent bureau administered from the central government in Washington.

The Park Service must not necessarily always be ready to change its policy to meet new conditions for this reason. A park is designed to be kept as it was for all time. It is the property of all of the people. It is a resource to be used by all of the people, but no group of people depend on this resource for their living as cattle raisers depend on the grazing lands or lumber companies on the forests. In other words, it is the national interest rather than the local interest that is most important. In the case of agencies like the Soil Conservation Service, the Forest Service, and the Division of Grazing, the national interest is also important, since all three are saving a national resource. But the local users live on the forests and the soil and the range. They must be protected. For this reason, there is a large amount of local control in these agencies. But in all of these cases, the local and the national interest should be balanced so that they work together for the common good.



## PROJECTS

1. Write to the state game department for a copy of the hunting and fishing laws, one set for the present, one for five years ago, and one for fifteen years ago. How have these laws changed? Can you explain why? If any of you know someone who hunts and fishes, ask him to tell you how the supply of game has changed since he began hunting and fishing.
2. Look in your local county history for the kinds of game animals that were originally in that area. Are there any of these species left there now?
3. Let the members of your class keep a list of the various species of wild life they see in the surrounding country. Try to identify as many of them as possible. Check with the state hunting laws to see whether they may be hunted or not and when.
4. Find out if there is a sportsman's organization in your neighborhood, and if there is, see if you can discover what its purpose is and how it is trying to carry it out.
5. Visit your markets. See how many species of wild life you can find for sale there.
6. How many parks are there in your neighborhood? Who runs them? What kind of parks are they? Lay out a plan for developing recreation areas in your county with an explanation of why you selected various places for recreation.
7. Plan a month's vacation for yourself and your family. Suppose you have \$500 to spend on this vacation. Just what sort of recreation areas should you visit to get the kind of vacation you want?
8. Suppose you are given the job of setting up the federal government recreation areas. Just what sort of recreation uses should you plan? How should you attempt to attract the visitors?

## DEBATES

1. Should the state or the federal government control wild life on the federal land?
2. Should game management be designed to increase the species of animals that men like to hunt, or should it be designed to preserve the natural balance that originally existed in nature?
3. Should the federal government run the parks at a loss so that more people can afford to go to them?
4. Is a bureaucracy like the Park Service the best form of government for administering federal lands that are to be preserved for all time?

## MINERALS

Come back to Duluth and take the train to Butte. As you

wind down the steep western slope of the Continental Divide into Butte, you will see beside the tracks patches of grey earth shot with streaks of green and blue. On the flat lands to the west of the town these patches cover hundreds of acres. And through them all you will notice sluggish little streams of these same green and blue colors. The vegetation that touches the borders of these strange fields and streams is dead and grey. This is the waste from the great copper mines. And in the distance you can see the clouds of yellow smoke coming from the chimneys of the copper smelters themselves.

When you go west from Butte to California, drive from Klamath Falls to Eureka on the Pacific Coast. If you don't get dizzy when you ride on winding narrow roads that look down a thousand feet of precipice into a cascading river, take the Klamath River Road. In one of the narrow valleys you pass through you will surely see a dredge eating up the green earth before it and leaving in its wake nothing but a mass of stones the size of a man's head. This dredge is digging up the earth, sorting out the gold, and then burying the earth under the gravel which has been dug up with it.

The road from Los Angeles to San Diego runs through two very different kinds of forests, both of which have been planted by men. The first of these forests is made up of green, umbrella-shaped orange trees. The other forest consists of a mass of tall, gaunt oil derricks. In the irrigation ditches under the orange trees, water is flowing. Around the oil wells the ditches are filled with black crude oil. These are the Los Angeles Basin oil fields which produce 8 per cent of our petroleum.

When you have ended this journey, you will have made a tour of some of the most important mineral resources of the United States. When you remember what the country looked like around these mines and wells, one thing will stand out. The ore pits and the placer mines and the oil derricks look vastly different from the green Wisconsin fields, the blue Lake Mead

behind Boulder Dam, the rolling grazing lands that slope away from the Mogollon Rim in Arizona, the architectural groves of redwoods on the Redwood Highway. In the localities from which man takes iron and gold and oil it is plain that something is being consumed. There are great pits in the earth, engines pumping and digging. On the other hand, the farms, water-supply projects, ranges, do not look as if they were being consumed in this very direct and relentless manner. Differences in appearance often don't mean very much. In this case, however, they are very important. They are a sign of the fundamental difference between the uses of mineral resources and the use of the resources of the soil and water.

The soil and water may be used in coöperation with the processes of nature. And as long as man coöperates with nature, these resources grow and reproduce themselves. Insofar as he uses them correctly, he is simply carrying on a natural process. Consequently, man's use of these resources looks natural. A herd of grazing cattle, a field of grain fits into a landscape; an ore pit does not.

The use of mineral resources has nothing to do with coöperating with nature. Nature stored the minerals in the earth. Man uses them, but he can do nothing to make more grow for the future. He simply takes them and leaves the scars behind.

You can see from this that the first type of resources, the resources of soil, land, and water, are part of something which may continue for all time. The use of mineral resources, is, on the other hand, temporary. It is not part of something which naturally continues forever.

There is another difference between soil and water resources and mineral resources. The first type, with a few exceptions like the production of hydro-electric power, have a single main job. That is to nourish and support life. The mineral resources, on the other hand, are not life supporting. Instead, they sup-

port civilization. Life is a process of nature. Civilization is a man-made process.

#### MINERALS, THE BASIC RESOURCE OF INDUSTRY

Originally civilization grew out of the use of the resources of the soil and water. But as soon as man discovered the minerals, he set out to make them into useful tools. This is another way of saying that first there was an agricultural civilization, then out of that grew an industrial civilization.

An industrial civilization would be impossible without minerals. The two most important minerals for industry are coal and iron, coal to supply the energy, and iron to make the machinery. Quite naturally, these two minerals were the first to be developed on a large scale.

From the very earliest period in American history it was known that there were deposits of these two essential minerals in this country. In 1679 Father Hennepin reported the discovery of coal on the Illinois River near what is now the city of Ottawa, Illinois.<sup>1</sup> Iron ore was discovered by an expedition sent to what is now North Carolina in 1585.<sup>2</sup> John Winthrop owned a smelting furnace at Lynn, in the Massachusetts Bay Colony in 1643.<sup>3</sup>

But though there was iron and coal, how much there was no one dreamed. Not very much was done about it for the first two hundred and fifty years of the existence of America. Then this was an agricultural country and the resources of agriculture were most important.

#### THE DISTRIBUTION OF MINERAL LANDS

In the beginning of our national existence all the mineral resources, except those in the original thirteen states, were the

<sup>1</sup> Van Hise and Havemeyer, *op. cit.*, p. 24.

<sup>2</sup> *Ibid.*, p. 59.

<sup>3</sup> Faulkner, *op. cit.*, p. 149.

property of the federal government. The question was what to do with these minerals. That they required some special treatment was recognized by the Ordinance of 1785 reserving to the government "one-third part of all gold, silver, lead and copper mines" which were to be disposed of along with the other "western" lands.<sup>4</sup>

In 1807 this mineral land policy was changed. Congress passed an act leasing to private operators several lead mines in Indiana territory. Then in 1829 the leasing idea was abandoned and Congress passed a law which permitted the federal government to sell outright reserved lead mines in Missouri.<sup>5</sup>

From 1845 to 1850 a series of acts was passed prohibiting the leasing system and substituting the idea of outright sale. President Polk, in his message to Congress, added one other point to this program for the disposal of federal mineral lands. He believed that some arrangement should be made in the sale "reserving to the Government an equitable percentage of the gross amount of the mineral product."<sup>6</sup> This was the first appearance of the royalty system in disposing of public lands. The royalty system means that the government demands that the purchaser of the mineral resource pay to the government a certain percentage of the value he takes from the mine. Congress rejected President Polk's suggestion to do this in 1845, but about ninety years later, Congress was passing just such laws.

From 1854 to 1936 the Lake Superior Region has produced 1,641,876,150 tons of iron ore<sup>7</sup> and 4,446,343 tons of copper.<sup>8</sup> If Congress had kept the idea of charging a royalty for mineral

<sup>4</sup> Van Hise and Havemeyer, *op. cit.*, p. 109.

<sup>5</sup> *Loc. cit.*

<sup>6</sup> *Loc. cit.*

<sup>7</sup> Robert H. Ridgeway and H. W. Davis. *Iron Ore, Pig Iron, Ferro-Alloys, and Steel*. Chapter from *Minerals Yearbook, 1937, Review of 1936*: United States Government Printing Office, Washington, 1937, p. 590.

<sup>8</sup> Letter from J. H. Hedges, Acting Director, Bureau of Mines, August, 1938.

lands that were sold, the return to the federal government from this land would be well over \$1,000,000,000 today.<sup>9</sup>

In 1846, Congress offered for sale the mineral lands in Illinois, Arkansas, Wisconsin, and Iowa at a minimum of \$2.50 an acre. Mineral land in the Lake Superior Region was offered two years later at a minimum price of \$5 an acre. Finally in 1850, all distinction between mineral land and agricultural land was removed and both types were offered for sale at the same price.<sup>10</sup>

The various laws regulating claims to mineral land in the western part of the country had certain differences from the laws permitting entry on non-mineral land. The chief of this was the fact that mineral lands could not be taken up in such large quantities as agricultural land. However, especially after the gold rush in California in 1849, local customs became the law so far as the ownership of mineral land was concerned.

Finally in 1866 and later in 1872, Congress passed a series of laws regulating the sale of mineral lands in the West. Certain types of deposits could be bought at \$5 an acre with a maximum of a little over twenty acres to a single person or group. Less concentrated lots were sold in areas of 160 acres at \$2.50 an acre. In 1897 petroleum land was added to the list of those that could be sold at \$2.50 an acre.<sup>11</sup> If, however, a homesteader found minerals on his land, those minerals belonged to him without any extra charge.

If you will compare these dates of various changes in the mineral land policy of the federal government with the dates of the great advances in the industrial development of the nation, you will see that the land policy follows in step closely behind the industrial development. Thus, when industry was in its infancy, Congress leased mineral land. A few years later

<sup>9</sup> Van Hise and Havemeyer, *op. cit.*, p. 110.

<sup>10</sup> *Loc. cit.*

<sup>11</sup> *Loc. cit.*



it began to sell the land outright. But as industry grew, the mineral lands from which come the basic raw materials of industry became increasingly easy to get. After the Civil War, during the great period of industrial development, mineral lands could be had practically for the asking. A homesteader could simply settle on 160 acres of coal land and get it for nothing. Many companies interested in acquiring mineral lands would pay people a small sum to homestead the mineral land, and then take it over as soon as the homesteader was given title to it by the government.

#### CONSERVATION OF MINERALS

One of the first important events in the beginning of the conservation movement was the publication of Major J. W. Powell's *Lands of the Arid Regions* in 1888.<sup>12</sup> Major Powell succeeded in having established in the Interior Department the Geological Survey, whose job it was to survey and catalogue the natural resources of the nation.<sup>13</sup>

In 1891 the first feeble effort to protect the basic resources of the nation was made. Congress gave the president the right to keep settlers out of valuable public timberland and to establish forest reserves. Until the administration of Theodore Roosevelt, President Cleveland was the only president who used that right to any appreciable extent.<sup>14</sup> This act was the result of efforts of the American Association for the Advancement of Science, which was at that time primarily interested in saving the forests. (See page 183.)

However, it was not until 1906, in the term of President Theodore Roosevelt, that the government became really interested in conservation. And once again the starting force came from those primarily interested in saving the forests. Gifford

<sup>12</sup> *Ibid.*, p. 5.

<sup>13</sup> Hacker and Kendrick, *op. cit.*, p. 410.

<sup>14</sup> *Ibid.*, p. 409.

Pinchot, then the head of the recently created Forest Service, persuaded President Roosevelt to stop settlement on 64,000,000 acres of government forest land. Out of this Pinchot created our great system of National Forests, one of the greatest conservation feats in our history. In 1907 he convinced the president of the need for establishing the Inland Waterways Commission supposedly to investigate inland waterways. But the Inland Waterways Commission did not stop with investigating water. It advised the President to call a conference of governors of the states to consider the problem of conserving all natural resources.<sup>15</sup>

The result of this was the famous White House Conference of 1908, during which the National Conservation Commission was founded under Pinchot. And so quickly did the idea of conservation catch on that at the same time forty-one state conservation committees and about fifty independent conservation committees were formed.<sup>16</sup>

One of the most valuable results of the White House Conference was the Report of the National Conservation Commission. This report was the first careful estimate of just what the resources were in the United States, and how rapidly they were being consumed.

Along with this account of the extent of our natural resources came a new idea of how to save them. The Committee which produced the report ended its introduction with this paragraph: "Finally, the conservation of our resources is an immediate and vital concern. Our welfare depends on conservation. The pressing need is for a general plan under which citizens, states, and nation may unite in an effort to achieve this great end. The lack of coöperation between the states themselves, between the states and the nation, and between the agencies of the national government, is a potent cause of

<sup>15</sup> Hacker and Kendrick, *op. cit.*, p. 410.

<sup>16</sup> *Loc. cit.*

the neglect of conservation among the people. An organization through which all agencies—state, national, municipal, associate, and individual—may unite in a common effort to conserve the foundations of our prosperity is indispensable to the welfare and progress of the nation. To that end the immediate creation of a national agency is essential.”<sup>17</sup>

No such national agency was created, but President Roosevelt did withdraw from entry a total of 148,000,000 acres of forest land. He also withdrew 80,000,000 acres of coal land, 1,500,000 acres of water power sites, and 4,700,000 acres of phosphate lands from entry.<sup>18</sup> The purpose of the President was to have Congress pass laws whereby the resources of these federal lands would be leased rather than sold outright. Congress, however, did not pass such a law until 1920. By that time, it had been decided that of the coal land withdrawn by President Roosevelt, only 29,883,336 acres<sup>19</sup> contained deposits valuable enough to keep. To this was added 5,000,000 acres of petroleum land, the land containing oil shale, natural gas, phosphorus, and sodium salts, and the water power sites. The royalty fee from government oil lands alone had reached a total of \$11,513,894 by 1937.<sup>20</sup>

In 1910 during the administration of President Taft another law regulating public lands was passed. This law distinguished between surface and sub-surface rights to federal land. It meant that if a cattle man, for instance, took up 640 acres of public range land, he had the right to the grass, but he did not own the minerals under the surface.<sup>21</sup>

After this beginning, the policy of restricting the use of the mineral deposits on public land remained unchanged with one great exception. This exception was the use of oil lands.

<sup>17</sup> Report of Conservation Commission, Vol. 1-2, p. 26.

<sup>18</sup> Hacker and Kendrick, *op. cit.*, pp. 410-411.

<sup>19</sup> Van Hise and Havemeyer, *op. cit.*, p. 12.

<sup>20</sup> Hedges, Letter, *op. cit.*

<sup>21</sup> Hacker and Kendrick, *op. cit.*, p. 411.

## FEDERAL CONTROL OF OIL LAND

The reason for this was that petroleum, which was a new fuel, was first thought to be very scarce. There was another cause for the attempts to restrict oil production. This is the fact that oil has a production problem quite different from that of any other valuable mineral. If you drill an oil well close to another person's property, you may draw the oil from under his property. Therefore, to protect himself, the other man will put up an oil well to get that oil before you do. You can easily see how this caused a great many oil wells to be drilled as soon as oil was discovered in any particular region. But all of these wells produced so much oil that prices fell rapidly. And as the prices of oil fell, the oil companies drilled more oil wells so they could get enough oil to sell to make a profit. Finally, prices fell so low that new drilling stopped until demand could catch up with supply.

The first attempt to control the production of oil came in 1924 when the Federal Oil Conservation Board was founded. This board tried to get producers to agree to control production. Unfortunately, this attempt did not succeed. Oklahoma through its Corporation Commission limited production in the Greater Seminole area to 450,000 barrels a day,<sup>22</sup> and divided this amount among the various producers in the area. In 1928, Oklahoma made this a state-wide system. In 1931 the Secretary of the Interior endeavored to get the governors of Texas, Oklahoma, and Kansas to form an interstate compact whereby they would try to get the producers to agree to limit production of oil in these states. However, small companies frequently refused to meet these agreements and proceeded to drain the oil fields. The big companies, on the other hand, were prevented by the anti-trust laws from making any strict agreement about the production and price of oil.

<sup>22</sup> National Resources Board Report, *op. cit.*, p. 407.

To control over-exploitation of oil on private lands, a section of the National Industrial Recovery Act of 1933 provided that the production of oil should be limited to the demand. Both state and federal agents tried to enforce this rule; but, after a bitter struggle, it finally collapsed when the Supreme Court decided in 1935 that the act as a whole was unconstitutional.

Today the production of oil is still controlled to some extent by state laws and interstate compacts authorized by Congress in 1935. The job of enforcing these compacts is difficult, however. The problem on federal oil land is simpler because the government has kept the ownership of the land and only rented the right to produce oil. However, oil from federal lands is only about 3 per cent of the total produced, and the reserves on this land are no more than 15 per cent of the total in the country.<sup>23</sup>

Control of oil production on government land followed a somewhat different pattern. First there was the withdrawal of oil lands on public domain. The chief purpose of this was to give the Geological Survey time to investigate this land, classify it, and enable the government to decide which of it was really valuable. After this classification, the federal government passed regulations whereby the valuable land was leased rather than sold. This reserved for the people as a whole a certain amount of the profit made from land which belonged to the people as a whole. From this beginning a system of laws designed to regulate the production of oil of federal lands has been developed.

To put a stop to the terrific waste of oil and the natural gas which is found with oil, the Secretary of the Interior, Ray Lyman Wilbur, in 1931, arranged for what is known as a co-operative unit production of oil in the government owned Kettleman Hills field in California. The Director of the Geological Survey got the producers to agree to produce the minimum

<sup>23</sup> *Loc. cit.*

amount of oil necessary to make a profit. This put a stop to the competitive drilling where one man would drill wells for the oil he didn't need in order to prevent another company from pumping out that oil through a nearby well. On March 4, 1931, Congress passed an amendment to the mineral leasing law. This amendment arranged for agreements like that on the Kettleman field on all government owned oil land. In 1935 this plan was extended by Congress to private land and today there are about fifty oil fields operating under an agreement with the Secretary of the Interior to produce oil on a coöperative basis.<sup>24</sup>

One thing which has greatly confused the regulation of petroleum production is the fact that the experts have been so uncertain as to how much there is stored in the earth. They would announce that the supply was practically exhausted, then someone would discover a new field which would, in spite of the increasing demand for oil, provide a supply for another ten years or so. Geologists have given up promising an end to the petroleum supply, particularly since it was learned that vast deposits of oil shale would provide petroleum for many years after the oil wells were exhausted, although probably at considerably higher cost.

In one way or another, this problem of regulating the production of oil is related to the production of all minerals. In general, the major influences affecting the production can be listed in this way. (1) Taxation. As we shall see, taxes on mineral lands have a great effect on how they are used. (2) Scientific development. As ways are developed to use minerals more efficiently so that less of that mineral will be needed to do a certain job, that mineral is being conserved. (3) Recoverability. Many minerals can be used many times after they are mined. (4) Price. When the price of a mineral is low, the producers can afford to mine only the richest deposits, often wasting the less rich

<sup>24</sup> Letter from Geological Survey.

deposits in the process. (5) Place. The nearness of a mineral to the place at which it is used helps determine how much that mineral is used. (6) International supply. A nation with large deposits of essential minerals is much more secure than one not so fortunate. This fact influences the development of mineral deposits and their conservation. (7) Supply and demand. Obviously, the problem of regulating minerals with a large demand and a small supply is different from that of regulating a mineral of which there is an abundance, but for which there is little use.

To see just how these rules apply, it is best to divide the minerals into two classes. The first class is the metals. This includes copper, iron, zinc, and so on. The second class is the mineral fuels. The chief of these are coal, oil, and natural gas.

#### TAXES AND MINERALS

Hibbing, Minnesota, in the Mesaba iron range, is one of the centers of the iron mining industry. One of the first things you notice about Hibbing is its schools. There are only about 15,000 people in Hibbing, yet its high school cost \$4,000,000. The school swimming teams of Hibbing have become famous throughout the state. Now it may seem far-fetched to connect the Mesaba iron range and high school swimming teams. Nevertheless, these two things are very closely connected.

Minnesota believes that the natural resources in the state belong to the people in that state. The Mesaba iron range is Minnesota's richest single resource. It belongs to large steel companies like the United States Steel Corporation and the Bethlehem Steel Company. The ownership and control of these companies is centered in New York and Pennsylvania.

In order to gain some of the value of this fabulously rich iron region for the people of Minnesota, the state legislature has put a high tax on the iron ore taken from the mines. A part of this tax money goes to the state and a part is kept in

the area from which the iron is taken. Thus Hibbing gets a very high revenue from the Mesaba iron range. This high revenue has paid for a fine school system with one of the best swimming pools in the country. And because the high school has such a fine pool and so much money to spend on training, Hibbing has one of the finest school swimming teams in the country.

These taxes fall into four groups. The first is called the *ad valorem* tax. This is simply a tax based on the value of property any property owner may possess. If a farmer has a farm worth \$10,000 and his state has a 10 per cent *ad valorem* tax, the farmer pays 10 per cent of \$10,000, or \$1,000 tax. In Minnesota, 16.31 per cent of all the money collected by *ad valorem* taxes is paid by the owners of the iron mines.<sup>25</sup>

This *ad valorem* tax has a direct effect on the use of iron ore. All the ore is used outside the state. The ore that is mined in the winter is stored until the ice on the Great Lakes melts, and then it is shipped in the spring to Cleveland and other lake ports near steel mills. Since a company must pay the *ad valorem* tax on the value of its property in Minnesota, it naturally wants to get that property out of Minnesota as quickly as possible. Therefore, the companies mine and ship the most valuable ore as speedily as they can and leave the low grade ores behind. This means that the supply of the high-grade ore is used rapidly, while much of the low grade ore is left to waste. Thus you can see how a high *ad valorem* tax exhausts a mineral supply.

In Wisconsin a type of tax called a severance tax was enacted to remove the bad effects of the *ad valorem* tax on minerals and timber. The severance tax is a tax on the value of the products taken from the land. The important thing is that the tax is collected only when the resource is taken from the land. If that resource has a high value, the amount of the tax is large. If, on the other hand, it is of little value, the tax is small.

<sup>25</sup> Letter from Minnesota Tax Commissioner, August, 1937.



Thus, nothing is saved by taking out only the products of high value.

The second type of Minnesota tax is the occupation tax. So far as the mining companies are concerned, this is a tax based on the cost of producing the ore. If the cost of production is high, the tax rate is low: if the cost is low, the tax rate is high. This tax attempts to balance the high cost of mining lean ore with the low cost of mining rich ore and thus promote the use of the lean ore.

A simple illustration will show how this tax works. The figures used here are purely imaginary and are not actual costs of mining and taxes.

*Rich Ore*

\$100	cost of mining 1 ton
15	tax on 1 ton of rich ore

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\$115	total cost of tax and mining
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*Lean Ore*

\$110	cost of mining 1 ton
5	tax on 1 ton of lean ore

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\$115	total cost of tax and mining
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The third type of tax is the royalty tax. This tax is paid by those who rent the mines to the iron mining companies. Since this tax is based on the value of the mined ore, it too has the effect of making it relatively more expensive to mine the rich ores, and thus force the companies to use the low grade ores.

The fourth type of tax is the personal property tax. This is a tax on the ore mined and stored. It is taxed according to its selling price in Lake Erie ports. Thus if the ore is valuable, the tax is high; if it is not valuable, the tax is low. Here again the tax system encourages the use of the low grade ores. There is also a reduction in this personal property tax if the low grade

ore which is mined and stored is properly cared for so that it will be preserved.

The companies insist that the taxes are so high that they cannot make a reasonable profit, or at least cannot make a profit on any but the high grade ores. They say that if all the taxes were reduced, they could afford to take out the low grade ores.

The state argues that, after all, the natural resources of Minnesota belong in part to the people of Minnesota and not to a few companies. They say that the tax structure simply returns to the state a fair share of the value of the iron mines. The state believes, however, in making tax laws in such a way that they will enable the companies to use the low grade ores, of which there are enough for a thousand years, and save the high grade ores which it is expected will be gone in another thirty years at the present rate of consumption.<sup>26</sup>

Taxes affect the mining of other minerals in the same way that they affect iron. *Ad valorem* taxes tend to increase the depletion of minerals, while severance taxes and other similar taxes usually help to conserve minerals by making it profitable to use the lower grade deposits which might otherwise be wasted.

#### MORE EFFICIENT USE OF MINERALS

The problem of more efficient use of a mineral is very well illustrated by copper. In the past twenty years, there has been a drop of about 40 per cent in the amount of copper obtained from a ton of copper ore.<sup>27</sup> At the same time copper refining mills have been able to increase by 20 per cent the amount of copper content recovered from the ore. Those two figures mean

<sup>26</sup> E. W. Davis, *The Iron Ore Deposits of Minnesota: The Effect of Existing Tax Laws on the Utilization of This Great Natural Resource*, An address delivered at the Minnesota Tax Conference. University of Minnesota, March 17, 1937, p. 18.

<sup>27</sup> Van Hise and Havemeyer, *op. cit.*, p. 76.

simply this. The ores used to produce copper have grown leaner and leaner and necessity has forced engineers to make the best of what is left.

Copper is just an example of technical advances that have been made in the manufacture of most minerals. When Siemens, for example, invented the open hearth process for making steel, he in effect increased the world's iron reserve by many millions of tons. The reason for this was that his process permitted the use of scrap steel and scrap iron as well as pig iron in making steel. This meant that iron which had been used before could now be melted up many times and used for new products, thus taking the place of newly mined iron ore. Today, about one-third of the steel products used are made from recovered scrap.<sup>28</sup>

In the case of copper, the use of scrap metal is even more advanced. Copper is not so quickly destroyed by corrosion as steel. In addition to this, copper is rarely used in such a way that it is destroyed. Thus today about 64 per cent of the copper used comes from scrap.

Improvement in the use of a mineral also saves great quantities of it. For instance, if steel and iron could be prevented by a cheap process from rusting, millions of tons could be saved every year. And a rust proof steel would not only save millions of tons of steel; it would also save many tons of lead, zinc, and tin which are used as coverings to prevent rust on iron and steel. When, for instance, the coating of fence wire finally breaks through, the iron or steel rusts, and the whole is discarded. It is lost forever so far as man is concerned.

The use of coal to produce electric power is a good example of just how much can be saved by advanced methods of mineral use. In 1919 it took 3.2 pounds of coal to produce 1 kilo-

<sup>28</sup> Erich W. Zimmermann, *World Resources and Industries*, New York, Harper & Brothers, 1933, p. 600.

watt hour of electricity in a steam plant.<sup>29</sup> In 1930 that much electricity was produced by 1.62 pounds of coal.<sup>30</sup> Twenty-four and nine-tenths million kilowatt hours of electricity are produced by steam plants today.<sup>31</sup> If the 1919 methods were used, this would take 39,840 tons of coal. Thus the new methods of production save the difference between 39,840 and 20,169 tons, or 19,671 tons of coal.

But if coal is an example of the advantages of the proper use of a mineral, it is also an excellent example of the difficulties which arise from bad markets.

#### MINERALS AND MARKETS

Suppose you have a coal mine. It makes little difference if it is a coal mine, an oil well, an iron ore pit, or a timber tract; but a coal mine will show some of the difficulties in the way of people who are faced with the need of making a profit out of the exploitation of natural resources. You have to pay your taxes, and taxes are getting higher all the time. But that is the least of your worries. As more coal mines open up, coal becomes cheaper, and new mines are opening every day. Then there is the interest on the money you borrowed when you were so optimistic about your mine. That has to be paid. Finally, some one comes along and invents a way to use oil in place of coal. Your market is cut in half. You can afford to take out only the coal which is cheapest to mine and at the same times brings the highest price. This means you can work only the richest veins. When they are exhausted you leave the mine to fill with water and collapse. You waste thousands of tons of coal that could have been used if only you could have made a profit by mining it. And all the while the supply of coal comes closer to the vanishing point. In the case of copper,

<sup>29</sup> Zimmermann, *ibid.*, p. 479.

<sup>30</sup> *Ibid.*, pp. 570-574.

<sup>31</sup> *Ibid.*, p. 564.

there are large mining areas in both Arizona and Montana that become practically ghost towns the minute the price of copper drops below 8 or 9 cents a pound.

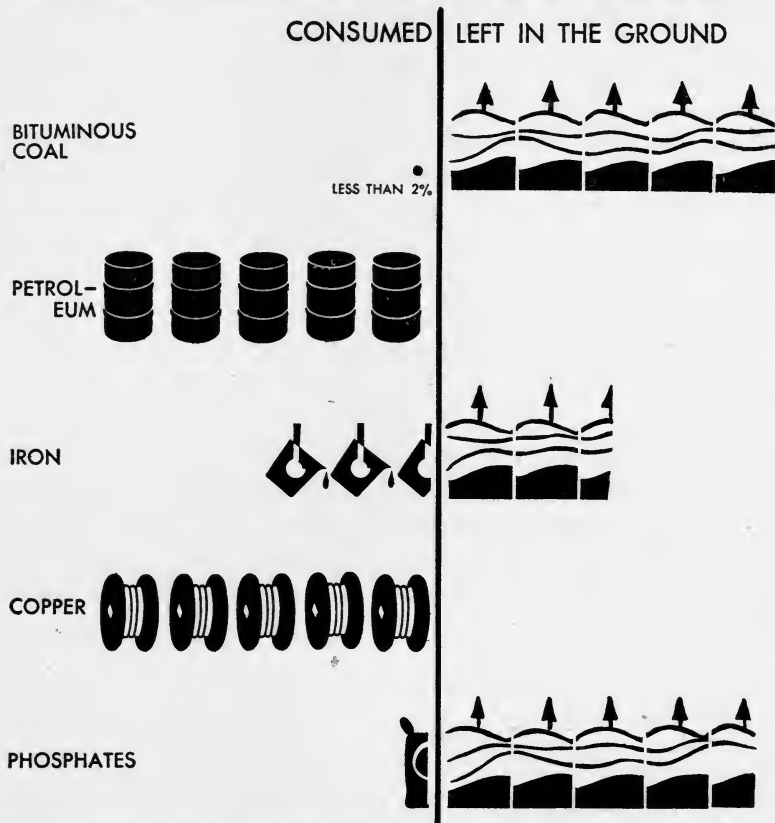
#### TRANSPORTATION

One of the chief reasons there are still large areas of low and medium grade coal in the Middle West is the fact that there was no way of bringing it to the industrial East where it could have been used during the period of industrial expansion when coal was the major source of energy. Today that coal is within the range of railroads, and markets are growing up around it. However, the price that such coal would bring is hardly enough to pay the cost of mining. On the other hand, if a mineral is not too bulky and if it can be produced cheaply, the opening of lanes of transportation will greatly increase production. Again copper is a case in point. In Africa there are vast copper deposits which were of little importance until a railroad was built from the mines to the sea coast. As soon as this was completed, African copper began to flood the market. It could be produced cheaply with native labor, and it was of high quality. The building of this railroad was one of the chief causes of the failure of many American low-grade copper mines.

#### INTERNATIONAL ASPECTS

Today the principal countries of the world are industrial, that is to say, the chief occupations of the people are industrial and the chief source of wealth is from industry. The minerals are the chief industrial resources. Therefore, if a modern industrial nation is to be a success, it must have access to cheap minerals. This cheap supply may be from within the country itself. Nations of this type are the United States and Russia. If the country cannot supply these minerals, they may be brought from colonies. England is a prime example of this type of industrial civilization. But it was the coal and iron supplies

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within the British Isles themselves which started Great Britain on its career of industrial supremacy.

A nation without these advantages can either fight to take them from someone else, as Italy did in Ethiopia, or it can develop activities best suited to the abilities of their people and their natural resources. Sweden and Norway do this and exchange their normal products for the resources they lack.

From the point of view of international relations there are two types of essential minerals. The first is the minerals which are needed for peacetime industries. Such industries need coal, iron, proper dyes for cloth, silver for photograph film, and so on. War industries, on the other hand, depend on two basic minerals, coal and iron. In addition to these, as weapons have been developed and as war has become a matter of destroying civilizations by starvation and bombs, practically every other mineral has become in some way essential in wartime. As a result there has been an increasing attempt on the part of governments to assure an adequate supply of practically all minerals. The excuse is that they are necessary in case of war. As the nations of the world scramble for these minerals, to be used in case of war, they create those very wars against which they are trying to build up their defenses.

One of the first things any nation does is to develop its mineral resources so that they will be available in time of war. Thus tariff policies in the United States protecting certain mineral developments are excused on the basis that even though such mines are inefficient and the products cost more than they should, such mines would be very valuable in time of war. The tariff and defense policy acts as a stimulus to mineral production, usually with minerals which it would be uneconomic to produce otherwise. Fortunately for the United States, there are few essential minerals which she does not possess in abundance, so that the uneconomic development of minerals for defense has not become much of a problem.

## GOVERNMENT REGULATION OF MINERALS

Industrially the United States is in much the same position it was in agriculturally in the 1840's. It has reached the end of a boom, the first boom, indeed, which has put industry in the commanding position in American economy. This means that industry is very powerful and has a big voice in the government. It does not want to be regulated.

The federal government is given a right to control only those minerals on federal land, and those minerals are not a very important part of our mineral resources. In several cases the government has set up boards and commissions which have tried to get certain private mineral users to coöperate. Two of these boards are the Federal Oil Commission and the Bituminous Coal Commission. These agencies try to adjust the supply of minerals to the market. In general their work is to save the resources under their care, and at the same time protect the producers. However, they have no power beyond that of asking the producers to work together toward a common goal of balanced use.

The Geological Survey is still going on with its work of surveying our mineral resources. At the same time it is directing Civilian Conservation Corps camps in certain conservation work, such as blocking mine fires. Geological Survey Engineers have worked out ways of controlling surface and underground waters in the Tri-State Mining District, thus aiding the recovery of the ore. At the same time the Geological Survey has mine supervising offices in Colorado, Utah, and Oklahoma. In the government fields it supervises conservation of oil and gas.

The United States Bureau of Mines, together with state bureaus of mines, makes technical studies of improved methods of production, treatment, and utilization of ores, and enforces certain mine safety standards. The Assay Office of the federal



government tests specimens of ores to determine their mineral content.

On the whole, however, the chief influence of the federal government on our mineral problems has been exerted through its distribution of the mineral lands to private individuals during the last half of the last century. This surrender of control over mineral development has led to wasteful exploitation and has created a series of complex conservation problems. In this respect the federal mineral policy is similar to the surrender of public control over forest and range land and water power. The American people are now trying to recapture some of this lost control. So far they haven't gone very far. In the case of minerals, this effort has until now been devoted principally to getting certain mineral users to coöperate so that some essential minerals like oil and coal will be exploited less wastefully.

This control of mineral use is in most cases a state right. The states have two types of control. One of these is the police power. As in the Oklahoma Oil Wars, the state can, if necessary, call out the National Guard to enforce regulations regarding the use of minerals. In addition to this, the states, through their power to tax, can control the use of minerals. Taxes of this sort are the severance laws of Wisconsin and the iron ore taxes of Minnesota.

However, with the possible exception of petroleum control, no plan to control minerals comparable to the federal control of agriculture has been successfully undertaken.

The wish of the Conservation Commission of 1909 for "the immediate creation of a national agency" to control mineral use has not been answered. It is difficult to work out any effective control so long as the industries that believe in, or are forced to wasteful use of minerals are powerful enough to block government control. That conservation and regulation of minerals is essential to the well-being of the people as a whole is unquestionable. The mineral producers, on the other hand,

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3. Are minerals or crops more important from a national point of view?



You do not say it is worth the two suits of clothes your father made in the tailor shop and sold at a profit of \$25. But those suits bought your bicycle. The twenty-five dollars merely represent the clothes. They are a symbol.

Translate this process into the use of land. Wheat is worth \$1 a bushel. You would give a farmer \$1 for a bushel of wheat. If prices fall you might be able to get that wheat for 50 cents. But whether you pay \$1 or 50 cents a bushel, the wheat will still make the same amount of bread. And it will take the same amount of nourishment in the soil to produce the bushel of wheat.

Nature does not care how much a thing costs. There is no such thing as money and trade so far as the process of life is concerned. Land must have a certain amount of nourishment. It will always need that nourishment, and if the land gets it, it will always yield the same amount of food.

You can see the difference now between the way man works and the way nature works. In our present civilization the goal of man has come to be the amount of money he can get from the land. The goal of nature is to keep a balance between soil, plants, and animals.

The effect of this difference between man's goal and nature's goal is this. Man has taken everything from the land which he can sell. In many cases he has not bothered to return to the land the nourishment which has been taken out by his crops. Thus the land becomes increasingly poor. The yield is less. The profits shrink. The land users fail. People decide that farming is not so good a job as keeping a store or working in a factory. The reason for this is that they have so misused the land that they can no longer make a money profit as farmers.

Thus we have failing soil and poor farmers. On the one hand, there are men on the land unable to grow enough food for their own use, and men in the cities too poor to buy food. On the other hand, there are surplus crops choking the markets

and going to waste. To improve this situation, some kind of a change must be made in our attitude toward the land. We must work out a plan of land use which will reconcile the changeable goals of man with the unchanging goals of nature.

The basis of land planning is to work out a system that will make land use profitable and, at the same time, preserve the value of the land, that is, to balance the needs of our money civilization and the needs of nature.

These two needs must be reconciled. The difficulty is how to reconcile them. The problem in a democratic civilization is to work out plans which will at the same time protect the land and the individual liberty of the land users.

Planning is not a new idea. To build a steel plant, for instance, requires months of planning. Any of the large jobs that engineers do must be planned down to the last bolt. But this planning is very different from land-use planning. The steel plant is built with the single purpose of producing a maximum quantity of steel at a minimum cost. Land-use planning is designed to find a way to use the land so that it will yield a continuous profit. That profit is not merely money, but security and satisfaction for the land users, permanent fertility for the land.

The idea of land planning first took hold in the cities twenty-five or thirty years ago, and its purpose was to protect the value of property. This idea is called zoning. It works this way. The city passes a zoning law which says that in certain areas there can be only certain kinds of buildings. Thus in districts in which people have houses, many zoning laws prohibit the building of stores and factories. The reason for this is that if factories and stores are built in a residential district, that district is less desirable as a place to live. The value of the houses consequently drops. Smoke and noise from factories makes living near them unpleasant. To prevent such nuisances,

the zoning law prohibits the factories and stores in residential districts.

From this came the idea of zoning to protect the people's rights and health. In New York City, for instance, there is a zoning law which forbids people to build tall office buildings unless the upper stories are set back from the street far enough to permit sunlight to strike the ground. Sunlight is not private property. It is something which is good for the people as a whole and this zoning law is to see that they get it.

In recent times the idea of zoning has been carried to the country. Rural zoning exists in California, Michigan, Minnesota, and Wisconsin. The country zoning laws protect property value and human rights. But they also try to do one thing more which the city zoning laws do not do. They attempt to promote an efficient use of the land. This might be called economic zoning.

When Wisconsin counties applied the principle of zoning to rural areas, they were not interested so much in the value of property. In most of the areas in which this law was applied, the property had little value anyway. The primary reason behind the law was to prevent useless new farm settlement on infertile land, and reduce needless costs of rural government (see page 81).

If you should take the afternoon train on the Soo Line that runs from St. Paul to Duluth, Minnesota, you would get a good chance to see some of the most acute problem areas of Wisconsin. After crossing the Saint Croix you will be in Wisconsin. The land is flat and fertile. On either side of the track are large fields, dairy barns in clumps of old trees, good roads, and occasionally a fairly large-size town. The fertile fields, deep with rich grass, that follow the winding banks of the St. Croix river are green and thick throughout the summer.

But after you pass the St. Croix the country changes. The barns are smaller and not so well painted. There are more dirt

roads. There are fewer old trees and more scrubby patches of aspen. The towns are little better than a collection of cracker-box houses set in a square like the headstones in a small graveyard. The main streets will run wide on either side of the railroad tracks for perhaps two blocks, then suddenly dwindle into a country road. That's as far as the burst of optimism ran that built the boulevard through the center of the town.

If the brakeman on the train is in a talkative mood, he will tell you that the railroad was built up through this area about twenty-five years ago to develop it. Then this northern corner of Wisconsin was covered by a virgin forest of the finest white pine in the world. The lumber companies were up there cutting it as fast as they could. The supply would never run out, so they thought. And the towns were built for the lumbermen. And then the railroad came to carry out the lumber and start the flow of goods back and forth, nourishing the towns along the line like a main artery in the blood stream. They expected that the towns would grow, and farms would spring up to provide food for the towns, and in no time it would be like southern Wisconsin.

But the brakeman will look out at the fields of scrub aspen and burnt-over pine and shake his head and say, "But it didn't work out that way." Perhaps at this point you are passing through a little town named Luck. You can see that it must have been given that name a good many years before it reached its present state. "No," the brakeman says, "it didn't work out. Just two trains a day now, the up-train and the down-train, and then a couple of freights."

Why didn't it work out? The reason is that the timber which was the great resource of the area was cut by the lumber companies without any attempt at continuing the forests by natural regrowth. Fires were allowed to sweep unchecked through the cut-over lands, destroying what little tree growth had a chance to come in after the logging. And the soil, unlike the rich earth

of southern Wisconsin, would not grow farm crops. After clear-cutting the forests, all that would grow was the aspen bristle, and even that did not do very well, with the fires that no one bothered to put out, and the cutting of the little whiskers of trees for the pulp mills.

The counties in this area, which was opened up so hopefully a short quarter of a century ago, have become a burden to the state. They are hopelessly in debt, and that debt is mounting. The little bit of farming and cutting aspen for pulp doesn't support the people very well, and leaves little money for taxes to keep up the roads and schools which are widely scattered over the area.

#### ZONING

One of Wisconsin's answers to this cut-over land problem is zoning. A state zoning board was set up. Members of this board, along with government experts from the Forest Service and the Soil Conservation Service and other government agencies, went into the areas and made a survey of the resources. They recommended certain changes. They showed in these recommendations how the land could be used to the better advantage of everyone. They explained how if the less productive land could be returned to forest the town would save money. The people living in those areas could be moved nearer to the towns. With the people more closely concentrated, there would be less expense for schools and roads.

The various counties appointed committees to study these recommendations, and then submitted to the voters in the various townships a plan based on them. If the voters elected to accept the plans, with any changes that either they or the county decided to make, the plan became a law. As a result, the use of property is restricted just as it is in the various zones of cities. The costs of government are reduced. Unoccupied land is protected from misuse.



Most important, these laws say that certain services of the county to the inhabitants—the maintaining of roads and schools, for example—shall be discontinued in closed areas. The principal purpose of these laws is to induce people to move out of poor areas where they cannot earn a living, and to reduce the costs of local government by closing such areas to further settlement.

In one area a man moved into a section which according to the zoning plan was closed to settlement. The case was tried finally in the Supreme Court of the state, and the court held that the zoning law was constitutional. The man could stay there, but the local government did not have to build and maintain a road to his house, nor did it have to take his children to school. His children were not excused from school, but he had to find some way himself of getting them there. The man moved back into the non-restricted area.

This illustrates a limitation of zoning laws. Such laws cannot correct the present abuses of the land. They have little direct effect on the way in which people on the land already use it. What zoning does do is protect unused land from unwise development.

#### STATE PLANNING

The most recent type of organized land-use planning is state planning. So far not much has been done about state planning beyond the making of first reports to discover just what are the problems in the various states. There are 42 states which have made some efforts to draw up a plan for the use of their resources. This movement was started by the National Resources Board which recommended this idea. The federal government through the Public Works Administration granted money to the states to hire workers to make the necessary investigations. So far, most of these state planning boards are still in the stage of fact-finding. Those that have worked out

plans have mostly confined themselves to plans for highways, flood control, parks, and the like, leaving agricultural planning chiefly to the agricultural agencies. One weakness of these boards is that they lack administrative authority to carry out plans—they can only recommend. Nevertheless, they have done much useful work in assembling facts and educating public opinion.

When people attempt to draw up plans for land use they must know certain things. These things may be put into two groups. First, there is the technical information. The way to prevent soil erosion is technical information which anyone attempting to do rural planning must know. How to control traffic is necessary technical information for the city planner. The second type of information might be called social and economic information. Technical information is fairly easy to get. It is definite and usually follows known rules. Social and economic information, on the other hand, is not definite. One important piece of economic information a planner must have is what permanent markets there are for the things the people in the planned area produce. The probable trends in population—what do people want? what can they do?—these are important parts of social information.

You can see that this social information is important, and at the same time hard to get. The National Resources Board in its 1934 report listed these three major headings as important types of social information which the planner must have: (1) the outlook for population; (2) the outlook for industrial conditions and employment; (3) relation of mechanical progress in agriculture to land utilization and land policy.

Information about population will tell the planner what the market for goods will be, where that market will be, what the requirements of cities will be, how many people will be depending on the land for a living and so on. The second heading covers the question of the use of industrial resources, power,

employment, and the production and consumption of manufactured goods. The last heading covers the trends in agricultural production, the ability of goods to reach market, and the effect of industrial progress on farm production.

According to the National Resources Board Report, this is a list of the technical information the planner must have. (1) A financial balance sheet. This would be a list of the worth of the resources and the amount of expenditures by government for the United States as a whole—a list of the financial assets and liabilities of the country. This would show what money was spent for permanent improvements as opposed to money which is spent for temporary improvements. Natural resources are permanent, and money spent to protect these would be shown on this balance sheet as money spent for a permanent investment. (2) Population, composition, and movement. A study of this subject would show what products would be needed where, and who could best produce them. (3) Mapping. (4) Climatology and climate risks. A more thorough knowledge of our various climates and how they act would help prevent such problems as future dust bowls. (5) Water studies. (6) Soils. (7) Vegetation. (8) General research.

#### REGIONAL PLANNING BASED ON A SINGLE RESOURCE

With all these various kinds of information necessary for planning, one thing is clear. It would be very hard to create any system of regions in which these many factors could be made to fit into any one plan. For instance, take one kind of regional planning which has already been working for several years, the interstate compact. In the chapter on water (see page 136) we have seen how these compacts have grown up for the purpose of dividing the water in such a way that everyone will get what he needs. This is a type of planning based on a single resource, water. But a great many things affect the use of water. Take the Tri-State compact between

New York, New Jersey, and Pennsylvania. This was designed to regulate the use of the water of the Delaware River. New York wants this water to drink, New Jersey and Pennsylvania need it for industry, recreation, and agriculture. And Pennsylvania also needs it for the protection of a fishing industry in Delaware Bay. Obviously, if a plan is to regulate all these factors, it will have to set up some control of all projects dependent on Delaware River water. This means that there will have to be plans for recreation, industry, fishing, agriculture, and population for the three states. Those who object to such plans claim that more and more will be drawn into the scheme until only a complete plan for the whole area would be sufficient.

There is another type of regional planning based on one resource. The United States Forest Service is an example of this. All the federal forests are under the direction of the Chief of the Forest Service in Washington. To give the Forest Service a direct relation to the various parts of the country in which it works, the country is divided into two sets of regions. The first of these sets of regions is a division according to the administrative needs and convenience. There are ten<sup>1</sup> regions of this type. The second division is according to forest problems. The first set of regions is composed of various national forests. The second type of regions consists of various regional forest experiment stations, of which there are twelve.

The primary work of the Forest Service is to protect and develop the national forests, though it also has important responsibilities in coöperating with the states and with private forest owners. Through the Washington office unified policies are carried out. The regional offices apply these policies in a way best suited to the particular region. Each individual forest supervisor has a certain amount of freedom in applying the general policies to his own area. The power flows from Washington to the regions and then down to the individual forest. At the

<sup>1</sup> United States Forest Service Directory, 1937.

same time, the information upon which these policies were based comes up from the forests through the regions to Washington.

On the whole the management is bureaucratic; that is, it is managed by appointed rather than elected officers. A certain amount of democratic control is given to the various advisory boards of private users of forest resources, but the final power rests in the Secretary of Agriculture and his forest assistant, the Chief of the Forest Service. This is the usual type of management of a resource wholly owned by the federal government.

So far as the forests are concerned, this has turned out to be a very efficient type of management. There are several reasons for this. One of them is that the idea of proper forest management has won tremendous public support. The saving of our forests has been one of the best publicized movements in American history. Arbor Day, for instance, has become a holiday in most states.

Another reason for the success of the National Forest administration is the maintenance of high civil service standards for the personnel. In any attempt at regional planning, the quality of the people who are to carry out the provisions of the plan is of primary importance.

A third reason for Forest Service success in planning is the fact that it has recognized the importance of local problems in drafting a national plan. The Forest Service has not permitted itself to become a central bureaucracy without any knowledge or feeling for local forest problems. The local forest supervisors and rangers have very considerable power to make decisions on the ground, quickly, without red tape, and with a close knowledge of local need and opinions. This might be called planning flexibility; that is, it is an example of how a plan must be able to be bent to fit local conditions. No plan so rigid that it ignores these local conditions can succeed.

Very well, you may say, if the Forest Service is a successful

type of regional planning, why not have a plan for the use of all our land on the basis of resources? There could be a series of government bureaus like the Forest Service to control all the land resources.

Such a plan would not be a good one, however. In the first place, it would be too confused. The Forest Service represents a plan for a single resource. If there were similar plans for all other resources, it would be clear that there would be a conflict. Someone would have to find a way to combine all these plans so that they could work together. And when that was accomplished, the whole development of the nation would be in the hands of a central bureau.

The Forest Service is, as was said before, a bureaucracy. The fact that it controls government property explains why it has been organized as a bureaucracy. The vast majority of our resources is private property. No plan could be made without taking these private resources into consideration. And the owners of these private resources would not willingly permit a bureau in Washington to control them.

The federal Soil Conservation Service (see page 84) is, like the Forest Service, a bureaucracy. That is, it is an organization composed of appointed officers and an appointed staff. The voters have no direct control over it. The S.C.S. method of land-use management follows, however, a somewhat different pattern than that of the Forest Service.

With money made available by Congress, the Soil Conservation Service purchased some nine million acres of land in certain important distressed regions. Most of these purchases were made in the Great Plains country where one of the great land-use problems arises from the fact that private people do not possess sufficient land on which to make a living. The Service leased its land to the private owners with certain requirements which would protect the land from misuse. With this added land, and proper organization, and the improve-

ments which the Service made on the land before it was leased, the private owners were able to work out a sound and profitable community of good land use.

This method of planning is based on a single resource, but it is administered by the users, rather than the government agency which holds title to the land. According to this method, the government protects the land by making the lessors agree to follow certain regulations. The local land owners, on the other hand, are free from any unnecessary harsh control from a central bureau, since they may use the land as they see fit so long as they do not break the regulations which were agreed upon when the lease with the Service was signed.

This type of land-use planning has been used for some time with mineral lands, but it is only recently that the leasing system has been applied to any great extent on agricultural and range land.

#### ECONOMIC LAND-USE PLANNING

There is one type of control of private resources which has been widely accepted by land users all over the nation. This might be called production or economic planning. The Agricultural Adjustment Administration is the major example of this. The Triple A seeks to regulate crop production and prices in two ways: (1) by having the people whose production is to be regulated decide by ballot whether they want regulation, and (2) by the power of the federal government to levy taxes. The taxes provide the money which pays the people for reducing their production.

The Triple A is planning on a big scale. It is the first real attempt at agricultural planning in the history of the country. It is important to observe that American economic planning began with agriculture. People usually are not ready to accept planning until they feel that there is no other solution. Agricul-

ture was the first major occupation of Americans which reached this unhappy state.

The nub of the Triple A program was crop reduction. The basic idea of the plan was to raise prices by lowering supply. During the Hoover administration a half-hearted attempt had been made to do this, but it had failed since there was no way of repaying the farmers for their lower production. (See page 65.) The important thing about the Triple A was that it did pay for this decreased production.

From the point of view of planning this means that the Triple A attempted to give the farmers some very necessary cash and at the same time control their production. Actually, the idea of paying producers to control production is not a new one. The tariff is a form of subsidy which exercises a control over industrial production. The major difference between the Triple A and the tariff was that the Triple A was a subsidy given only to those who agreed to accept a planned production. In other words, the government was paying people to support this plan.

If we trace the flow of power in the Triple A, we can say that it began with Congress. From Congress it went to the actual producers who elected to accept or refuse crop reduction. When a two-thirds majority of producers accepted reduction, the power then flowed to the Department of Agriculture which administered the Agricultural Adjustment Act. The only direct authority above the administration of the Triple A was the courts, and it was the courts who overthrew the original Triple A. The opposition did not come from the producers. Instead it came from the manufacturers who paid processing taxes which were given to the producers. Thus the first attempt to plan production by paying producers to coöperate with the plan failed. Actually, most manufacturers collected the processing tax from consumers by charging higher prices for their goods. However, since the manufacturers believed that these higher



costs would cause consumers to buy less, they felt that the processing tax was unfair to them.

There are other proposed systems of planning, all of which have several weaknesses. Some people believe in laying out the country in districts according to metropolitan influence. The northwest, for instance, would be a district in which Portland is the dominating metropolitan center. The intermountain region would be laid out around Salt Lake City and so on. The trouble with this is that, although each city might be the most important urban center in the area, it in no way reflects the types of activities which go on there. Planning, which is primarily concerned with these activities, is an attempt to adjust them so that they will be permanently profitable.

Another type of proposed planning region is based on an arrangement of groups of states. This is the method followed by the U. S. Farm Security Administration. Unfortunately, the same objection applies here that ruled out the metropolitan influence system. It is difficult to group states in such a way that any group will represent unified activities.

#### OVER-ALL REGIONAL PLANNING

One type of planning that avoids most of the difficulties of the methods we have just discussed is called over-all regional planning. To have regional planning, it would be necessary to divide the country into a series of regions in which a majority of the problems are the same. For instance, there would be a mid-western region. Everybody has an idea of what territory you mean when you say midwest. They probably couldn't draw an exact boundary, but whatever territory they selected would probably include parts of Ohio, Indiana, Michigan, Illinois, Wisconsin, Missouri, Kansas, Nebraska, Iowa, South Dakota, Minnesota, Oklahoma. The reason for this is that this region has a regional character, indicating that the problems and the activities of the people are characteristic of that region. The

New England character, for instance, is supposed to have certain traits of frugality and shrewdness. New England soil, New England factories, New England activities, such as fishing, are all thought of as belonging particularly to New England. In other words, all of the factors that affect planning in the area called New England are much the same. The same thing is true in the Great Plains. When you think of the Great Plains, you think of cattle as the major industry. You think of a certain type of person as a typical Great Plains rancher. You think of a certain kind of flat land as Great Plains country. In this way you can divide the country into about seven regions. These seven regions would not necessarily follow state lines.

The major objection to over-all regional planning which disregards state boundaries is this. Within each state there is set up a series of county, town, and state governments. These units are convenient tools of government. If regions should be laid out so that parts of two or more lie within one state, that will mean that it will be difficult to adjust the units of state government to two or more different types of regional plans.

The important thing about planning regionally or by any system is that the plan should do three things. (1) It should protect the resources of the region. (2) It should enable people to have what is called an abundant life. (3) It should give people the highest amount of individual liberty. The flow of power must run in such a way that the big decisions are always made by the people in the region affected, and that in carrying out the will of the majority, the minority groups are not treated unfairly.

#### TENNESSEE VALLEY

There is one section of the United States in which planning is being tried on a large scale. This is the Tennessee Valley. The Tennessee Valley Authority is a planning agency based on a river system. Primarily the Tennessee Valley Authority has

the job of bringing the resources of this region to their greatest usefulness. The plan has five parts: (1) navigation and flood control, (2) electricity, (3) plant foods and soil conservation, (4) national defense, (5) development of Tennessee Valley resources.

The Tennessee Valley Authority grew out of a program for national defense. Without a question, national defense is the work of the federal government. In this particular case, national defense was to be served by making nitrates for ammunition. To produce the nitrates, electric furnaces were needed. To produce electricity, water-power dams were built.

For a long time after the World War, the federal interest in the Tennessee Valley was nothing more than an unused nitrate plant. Then with the growth of what we have described as a second phase of the conservation of our national resources, the Tennessee Valley got a new use. The basis of this use was the production of electric power. The federal government does not, by the Constitution, have the right to set up a power-plant for the single purpose of producing power. It does, however, have the right to insure the navigability of streams. To control navigation of a stream like the Tennessee River, the level of the water in the channel must be fairly constant. As everyone knows, in most rivers, there is high water in spring and low water during the summer. If you want to have a constant supply of water, you have to build dams to hold back the spring floods and then release this flood water during the summer.

Water released from the flood dams can produce electric power, and the government saw no reason why power should not be produced by the Tennessee Valley flood dams.

There is one difference between a dam built particularly for flood control and a dam built for the single purpose of producing electricity. A flood-control dam should be empty as much of the time as possible so that there will be plenty of room for the coming flood waters. Electric power dams, on the other hand,

need a constant supply of water in all seasons. These two purposes are contradictory. However, if you build a series of dams with one feeding the other, it is possible to keep the power dams always properly full, and, at the same time, regulate the amount of water in the flood dams. The system works like this. In the spring all the dams are full. During the summer water is let out of the flood dams to keep the power dams full. By winter the flood dams are practically empty, but the power dams have had a constant supply of water from the slowly emptying flood dams.

Since the federal government has produced the electricity as a byproduct, the Supreme Court said that it has the right to sell that electricity. In order to sell electricity, it is necessary to have a market. In the Tennessee Valley, a large part of the population consisted of farmers living on submarginal land who couldn't afford to buy power. The job of the Tennessee Valley Authority was to make it possible for these people to use electricity. The Tennessee Valley Authority system has been to reduce the cost of electricity. By reducing the cost they have increased the market. It happens that when electricity is produced by water-power, it costs just about as much to produce a little electricity as it does to produce a lot. Therefore, if you can sell a lot of electricity at a low price, you will still make more than if you sell a little electricity at a high price.

Once dams have been built, the next great problem is to prevent their filling with silt. The Tennessee River runs through hilly country. Many of these hillsides have small farms on them from which the soil has been eroding for years. Consequently, if silt was to be kept out of Tennessee Valley dams, something would have to be done about erosion. The Tennessee Valley Authority approach to that problem was to be a large educational campaign. They didn't tell anybody they would have to practice strip-cropping, or contour plow-

ing, or crop rotation. Instead they set up demonstration farms in which these good soil practices were carried out. The farmers in the surrounding country could see the better crops. Once they became interested, the Tennessee Valley Authority said, "We will help you manage your land in the same way." They provided machinery for the contour plowing, cheap fertilizer made in the nitrate plant, and advice about crops. In areas where erosion had advanced so far that there was no hope of farming it, the Tennessee Valley Authority bought the land and planted forests. The purpose of this is to hold the soil on the hillsides, rather than let it down into the stream.

The next step of the Tennessee Valley Authority has been to find out just how the resources of the area can best be used. First of all there is the problem of transportation. The dams have been so built that eventually there will be a nine-foot channel running from Knoxville, Tennessee, to Paducah, Kentucky. This means that there will be an outlet for the produce of the Valley by cheap water transportation to Pittsburgh, the Great Lakes, the upper Missouri, and the Gulf.

Fifty-two per cent of the land surface of the Tennessee Valley is in timber. Through research the forestry division of the Tennessee Valley Authority has made various studies to figure out ways in which this forest land can provide work and income to the people who live in the region. Forestry is very important to the Tennessee Valley Authority because the forests are responsible for keeping much of the soil on the hillsides and out of the streambed.

Another kind of research undertaken by the Tennessee Valley Authority is a survey of mineral resources in the area. The purpose of this has been to find industrial occupations and markets for Tennessee Valley Authority electricity, which would be needed in factories using these minerals.

As you can see now, all the activities of this area depend on one another. Any plan to develop the valley must include all

these activities. The Tennessee Valley Authority in drafting its plans has tried to keep several things in mind. First, it had to make use of the other governing agencies already working in the area. These government agencies range from the county agents of the Department of Agriculture to the Federal Forest Service, the Biological Survey, state agricultural departments, state land grant colleges, and so on. These agencies supplied information to Tennessee Valley Authority specialists and helped them to carry out the Tennessee Valley Authority land-use program.

The greatest problem in any planning system is the administration. One difficulty is to get the people in the planned area to follow the plan. Another is to keep the plan sufficiently flexible so that it can be made to fit various local requirements. Finally, the administrators must be men capable of applying the plan so that it really achieves its purpose of building up a balanced use of the resource, and a satisfied population. All of this depends on whether it is possible to find and keep administrators of such high quality.

On the whole this program has been fairly successful so far as improving the agricultural methods of the region. The land has become more stable. New methods of cropping have taught the people how to grow more and better food for themselves. But the Tennessee Valley Authority has not solved the problem of what to do with surplus crops. If the farmers of this area are to be brought up to the so-called American standard of living, they will have to have some way of earning cash. They will need this not only for the automobile, the electric lights, the radio, the washing machine, and the many other things which city people and prosperous farmers think of as necessities for decent living conditions. They will need it for fertilizer, and machinery, and the other farm materials that are necessary to produce crops and keep up the fertility of the soil.

The Tennessee Valley Authority has started the farmer on

the way to good soil management, but it has so far provided only one way to keep it up. That is by payments in one form or another from the federal government. If taxpayers in other parts of the country grow tired of assisting the farmer in the Tennessee Valley, many farmers will be forced to drift back to their old habits of tillage. And when that happens, the muddy streams will again begin to fill the expensive reservoirs built on the rivers of the area. The Tennessee Valley Authority thinks that the expense of supporting the good soil practices of the farmers is justified by the fact that it saves the dams. But that is no solution of the problem. It is hoped that cities will grow up in the valley because of the cheap electric power which is produced by the government power plants. These cities will then become markets for farm produce from the farmers. That would be a solution.

But until cities do grow up, the voters of the United States will have to decide this question. Should the farmers be given aid until that day in the future when they may become self-supporting, or should they be allowed to become once again a sub-marginal population on sub-marginal land?

This is not a question of whether the voters want to help the farmers of the Tennessee Valley. It is rather one that demands a decision as to whether the federal government should try to assist the nation as a whole to develop. Many of the people of that area would prefer to be allowed to go on as they have been for the past hundred years or so. The question is, can the nation afford to let them do this? With foreign markets for American goods shrinking, can it afford to let a market with the possibilities of the Tennessee Valley go undeveloped? For if the area were developed, it would become a vast market for manufactured goods. And again, can the nation afford to let the \$500,000,000 being spent on dams and river development in the Tennessee Valley be destroyed by silt? This much is certain. Private industry has been slow to develop

the Tennessee Valley. Can, or should the federal government try to speed up this development? That is something the voters of the next twenty years will have to make up their minds about.

#### A PLAN FOR PLANNERS

To stop the erosion of the soil, the Soil Conservation Service was created. To bolster up the farm crop market, the Agricultural Adjustment Administration was created. To help farmers to produce more with greater efficiency, the Agricultural Extension Service was created. To each new problem of use of the land, government countered by creating some agency whose job it was to try to find a solution.

A sick man with a specialist for each of his many ailments doesn't have much chance to survive if one specialist doesn't know what the other is doing. The same thing is true about agriculture. If the land grant colleges try to increase the farmer's crops while the Agricultural Adjustment Administration tries to make him grow less crops and the Soil Conservation Service tries to make him grow different crops, agriculture would just collapse in a tangle. The fact that specialists have been called in is a sign that agriculture has reached a point at which some sort of control is necessary. With this control some sort of central organization had to be created, so that the various efforts to aid agriculture would not end in a stalemate. In 1938, the entire Department of Agriculture was reorganized. The Office of Land-Use Coordination was given the job of keeping all of the various bureaus and agencies working together smoothly. The Bureau of Agricultural Economics became the source of the plans for the other divisions to follow out. In this way the Department of Agriculture adjusted its organization so that it could work and plan as a unit.

The Department of Agriculture has made ten major attacks on the farm problem. Here they are.



WEATHER BUREAU

FOREST SERVICE

FARM SECURITY ADMINISTRATION

BUREAU OF HOME ECONOMICS

BUREAU OF DAIRY INDUSTRY

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

BUREAU OF AGRICULTURAL ECONOMICS

OFFICE OF EXPERIMENT STATIONS

BUREAU OF PLANT INDUSTRY

BUREAU OF AGRICULTURAL CHEMISTRY AND ENGINEERING

SOIL CONSERVATION SERVICE

EXTENSION SERVICE

POTOMAC STATISTICS, INC.

1. An attempt to save the land of the farmer by preserving the markets and agricultural production. Under this head are the Soil Conservation and Domestic Allotment Act of 1936, the Sugar Act of 1937, and the Agricultural Adjustment Acts of 1933, 1937, and 1938 (see pages 66-72).

2. An attempt to insure the farmer's crop yield by the Federal Crop Insurance Act of 1938.

3. An attempt to keep the prices of agricultural products up to a point where they will yield a profit, by the Marketing Agreements under the acts of 1937 (see page 70), and the surplus commodities program under the Surplus Commodities Act of 1937-38 (see page 83).

4. An attempt to reestablish the farmer who is on the downgrade, and to put a stop to farm tenancy under the Bankhead-Jones Farm Tenant Act of 1937 (see pages 76-77).

5. An attempt under the Bankhead-Jones Farm Tenant Act of 1937 (see page 75) to adjust certain factors of land use which are out of balance. This act was designed to improve the opportunities for making a living by people on poor farms in poor agricultural areas. The act provides for acquiring the poor lands and converting them into uses which will improve the pattern of land use and the economic well-being of the area.

6. An attempt to control erosion under the Soil Conservation Act of 1935 (see page 72).

7. An attempt to control flood waters under the Omnibus Flood Control Act of 1936 and amendments of 1938 (see page 114).

8. An attempt to make it possible for the farmer to use his woodlot profitably under the Norris-Doxey Act of 1937 (see pages 88 and 197).

9. An attempt to get the most use from water in the arid and semi-arid regions under the Water Facilities program of the Pope-Jones Act of 1937 (see page 126).

10. The use of emergency relief money to preserve wild life, forestry, soil, promote drainage, and control insects.

In addition to these activities of the Department of Agriculture, there is the Farm Credit Administration, which lends money to farmers in need, the National Resources Committee, which is making surveys of the extent and use of our resources, the Bureau of Reclamation, the Indian Service, the Geological Survey, and the Division of Grazing in the Department of the Interior, all of which are working on the problems of land use. Finally there are the activities of the states and the land grant colleges to handle the problems of land use which must be made to fit in with the various federal programs.

The job of the Bureau of Agricultural Economics is to help these various programs to focus on a unified goal. Its immediate objective is two things, stability and security for the farmer. Under stability can be listed stable farm prices and incomes, stable soil, water supply, forest, range, and wild life, and a stable and efficient farm production. Under security is first of all the carrying out of a plan that will permit a higher percentage of farmers to own their own farms, and greater security for those farmers who must continue as tenants. In general terms, the main objective of this program is "higher standards of rural living and stability of rural communities, governments, and regions through better land use."<sup>2</sup>

Let us take a specific problem in controlling land use. At one time the Piedmont Plateau was one of the most valuable agricultural regions of the United States. Today it is one of the greatest agricultural problem areas. Boll weevil kills the cotton, erosion destroys the soil, cotton market failures wipe out farm profits. Thousands of people have abandoned their farms to find jobs in the towns. Many farms have been taken over by lending agencies because the farmers couldn't pay their debts. Many more have been taken over by the state or county

<sup>2</sup> Address by M. S. Eisenhower, "*Land Use Coördination*," p. 4.

governments because they couldn't pay their taxes. Thousands of men who once owned their farms are now tenants who have no security and a very low standard of living. It would be pointless for the government to spend money explaining to these people how they could again be successful farmers when they have no money with which to carry out this good advice. At the same time, it would be equally pointless for the government to give these people money to start again if they were not helped to avoid the problems of the past. Under the Bankhead-Jones Farm Tenant Act the land which has been eroded beyond repair is purchased by the federal government. Tenants who want to own land are lent money by the same act to purchase farms. Under the Agricultural Adjustment Act farmers are encouraged by payments to plant crops which will save the soil. Rehabilitation loans provide money for farmers to get on their feet again and at the same time require that the farmers use good farm practices. The Soil Conservation Service shows the farmers how to plow and terrace and plant their hillsides so that they will not wash away. The state Soil Conservation District Laws and rural zoning laws give the farmers means of organizing the use of the land so that it will be a permanent resource. Changes in the tax system can encourage farmers to use their land more wisely.

The basis of this planning is not any one government bureau like the Bureau of Agricultural Economics. Instead it is the farmers themselves. The federal and state government agencies can make a survey and find out what has to be done, but the farmers themselves have to work out methods of putting these plans into practice. For that reason County Agricultural Planning Committees have been created. These committees consist of a number of representative farmers, the county agent, members of the Agricultural Adjustment Administration county committee, representatives of the Soil Conservation Service, the Farm Security Administration, and representatives of other fed-

eral or state agricultural agencies in the county. These committees work out a plan for the use of land in their own county. It is expected that they will work out problems of crop adjustment, back taxes, tenancy, forestation, erosion control, and so on.

In each state a State Agricultural Planning Committee is created to unify the plans of the various county planning committees. The State Committee consists of the various state and federal land-use officials plus farmers who represent the various types of farming carried on in the state.

If there should be a regional planning committee in that area, the plan would go to it for further revision and suggestions. In the Great Plains Region, for example, there is a committee for the Southern Great Plains and another for the Northern Great Plains. These groups are made up of federal and state planning officials who work out a unified plan for the region.

The Bureau of Agricultural Economics is the cap-stone on this whole structure. Here the plans from all over the country are collected and studied. It is the job of the Bureau to see that the plans all fit together. This means that crop production goals, erosion control measures, probable markets for crops, and so on, do not conflict. Obviously planning would be a failure if one section of the country was planning to improve land for greater wheat production while the rest of the country was suffering from a glut of wheat.

In skeleton form this whole complicated combination of agencies which tries to plan the use of land amounts to this. On the one hand, there are the federal and state agencies all working to promote better principles and methods of land use and unified by the Bureau of Agricultural Economics in the Department of Agriculture. On the other hand, there are the county agricultural committees and the state and regional committees above them, which translate these principles as

they are developed by the federal agencies into concrete plans for the individual farms in the counties, states, and regions. This organization under the Bureau of Agricultural Economics does not include the land-use agencies of government attached to other departments, such as the Interior. However, the agencies of all departments of government do work together through the land planning committee.

A vast machinery for the control of land use has been created in the past few years. Under the present laws this machinery is made to work by two things: (1) The gift of federal money and aid to those who will comply with the land-use plans. (2) The coöperative effort of the land users themselves, who may apply the machinery of land-use management to their own farms. The success of this machinery will in the long run be measured by the two words stability and security, stability of the land and security of the farmer.

Thus America begins its greatest experiment in democracy. The basis of this experiment is control of land. It is no longer possible to discuss whether or not we may believe in land control. Land control is here. It didn't come with any political party, or any particular group of men. It came from necessity. It was a case of either stopping the destruction of the land, or letting the growing burden of wasted land destroy us.

If land-use planning is to achieve the goal we have set for it, it must become a part of our democracy. It can reach this goal only if the people who are responsible for our government, and that is every American citizen, understand the needs of the land and the land-users. Out of such understanding a workable and permanent land-use plan can come.

But all the plans, and all the democratic institutions made out of such plans are useless if one thing is lacking. That is the knowledge of the place of man on the land. Land is permanent, individuals are not. The individual may use the land as a source of food, and wealth, and well-being. But he may not

consume the land if mankind is to continue. The foundation of good land use is the realization of men who use the land that they hold it in trust for those who are to come after them. "He who knows what sweets and virtues are in the ground, the waters, the plants, the heavens, and how to come at these enchantments, is the rich and royal man."<sup>3</sup>

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### PROJECTS

1. Write to your state, county, or municipal board. Find out what types of land planning they are attempting in your area.
2. Assume that you and your classmates are farmers in some nearby area. Try to set up a zoning project for that area similar to the Wisconsin zoning method.
3. Try the same thing with the Soil Conservation District law.
4. Draw up a coördinated plan for the use of all the land resources in your area. You can get necessary information for this from the county agricultural agent, the county commission, and the various other agencies which control land use.
5. If you live in a city find out how the zoning laws have been applied there.

### DEBATES

1. Is the planning board justified in forcing a man to move from a backwoods area in order to save the cost of school transportation and roads?
2. Should America plan to buy its raw materials elsewhere and become a manufacturing nation like Great Britain, or should it plan to produce its raw materials at the cost of added taxation?

<sup>3</sup> Ralph Waldo Emerson, quoted in *Little Waters*, by H. S. Person, Washington, 1936, p. 75.

# FEDERAL AGENCIES ENGAGED IN DEVELOPMENT,

		AGRICULTURE	FORESTS	RANGES	SOIL CONSERVATION
DEPARTMENT OF THE INTERIOR	OFFICE OF INDIAN AFFAIRS	Agricultural Improvement on Indian Reservations	Indian Forests	Indian Ranges	Soil Conservation on Indian Lands
	NATIONAL PARKS SERVICE		National Park Forests	National Park Ranges for Wildlife	
	DIVISION OF GRAZING			Administration of Ranges in Taylor Grazing Districts	Soil Conservation on Taylor Grazing Lands
	GENERAL LAND OFFICE		Administration of Forests on O. & C. Revested Land Grant	Grazing Leases on Public Domain not in Taylor Grazing Districts	
	DIVISION OF TERRITORIES AND ISLAND POSSESSIONS	Agricultural Development and Rehabilitation in Territories & Island Possessions. Obtains Coop. of Other Federal Agencies	Coordinates Forest Development in Territories and Island Possessions	Coordinates Range Development and Conservation in Territories and Island Possessions	Coordinates Soil Conservation in Territories and Island Possessions
	PUERTO RICO RECONSTRUCTION ADMINISTRATION	Agricultural Development and Rehabilitation in Puerto Rico. Obtains Coop. of other Federal Agencies	Finances and Coordinates Forest Development and Conservation in Puerto Rico	Finances and Coordinates Range Conservation in Puerto Rico	Finances and Coordinates Soil Conservation in Puerto Rico
	BUREAU OF RECLAMATION	Planning and Construction of Irrigation Projects		Irrigation of Pastures in Reclamation Projects	
	GEOLOGICAL SURVEY		Classifies Minerals in National Forests		
	BUREAU OF MINES				
	PETROLEUM CONSERVATION COMMISSION				
	NATIONAL BITUMINOUS COAL COMMISSION				
WAR DEPT.	CORPS OF ENGINEERS				
DEPT. OF COMMERCE	CENSUS BUREAU	Agricultural Census			
	BUREAU OF FISHERIES				
INDEPENDENT AGENCIES	FARM CREDIT ADMINISTRATION	Credit for Farmers			
	TENNESSEE VALLEY AUTHORITY	Agricultural Development in T V A	Forestry in T V A	Pasture Development in T V A	Soil Conservation in T V A
	RURAL ELECTRIFICATION ADMINISTRATION	Rural Electrification			
	INLAND WATERWAYS COMMISSION				
	FEDERAL POWER COMMISSION				



# CONSERVATION AND ADMINISTRATION OF NATURAL RESOURCES

INLAND WATERS	WILDLIFE	FISHERIES	RECREATION	MINERALS	LAND ADMINISTRATION
Water Conservation on Indian Lands	Wildlife Conservation on Indian Lands	Fish Conservation on Indian Lands	Recreation on Indian Lands	Mineral Administration on Indian Lands	Administration of Indian Reservations and Lands
Protection of Natural Waters in National Parks	Wildlife Conservation in National Parks	Fish in Nat'l Parks	Recreation in National & State Parks & Monuments		Administration of National Parks
Water Conservation for Livestock in Taylor Grazing Districts	Cooperates with Biological Survey in Wildlife Conservation in Grazing Districts				Administration of Public Domain in Taylor Grazing Districts
On Recommendation of Fed. Power Comm., Reserves Public Domain Needed to Protect Water Power Development				Handles Mineral Claims on Public Lands	Surveys Public Domain; Adjudicates Claims; Issues Land Patents; Handles Patents and Mineral Claims in Nat. Forests
Coordinates Water Conservation and Development in Territories and Island Possessions	Coordinates Wildlife Conservation in Territories and Island Possessions	Coordinates Fishery Conservation and Development in Territories and Island Possessions	Coordinates Recreation Development in Territories and Island Possessions	Coordinates Mineral Development in Territories and Island Possessions	Coordinates Administration of Federal Lands in Territories and Island Possessions
Finances and Coordinates Water Conservation and Utilization in Puerto Rico	Coordinates Wildlife Conservation in Puerto Rico		Finances and Develops Recreational Projects in Puerto Rico		Acquires & Administers Land for Rehabilitation Projects in Puerto Rico
Irrigation Projects and Incidental Flood Control	Constructs Irrigation Reservoirs Useful to Wildlife	Constructs Reservoirs which are Stocked with Fish	Constructs Reservoirs Useful in Recreation		Administration of Federal Lands in Reclaimed Projects
Investigates Surface and Underground Waters				Geological Mapping, Mineral Classification & Supervision of Mineral Operations on Public Lands	
				Analyzes Mineral Production, Promotes Improved Mining Methods	
				Conservation of Oil and Gas	
				Conservation and Economic Utilization of Bituminous Coal	
Flood Control Plans and Projects					Administration of Flood Control Reservoir Sites
	Conservation of Fur Seal	Conservation of Fish			Administration of Pribilof Islands
					Administers Foreclosed Lands
Navigation, Flood Control & Power in T V A	Wildlife Conservation in T V A	Fish Conservation in T V A	Recreation in T V A	Mineral Development in T V A	Administration of Reservoir Sites in T V A
Promotes Development of Navigation Operates Barge Lines & Terminals					
Investigates Water Power Resources. Regulates Development and Use of Water Power on Navigable Streams				Promotes Conservation of Natural Gas, Regulates Interstate Transportation and Sale and Exportation of Natural Gas	Recommends Reservation of Public Lands Needed to Protect Water Power Development

# FEDERAL AGENCIES ENGAGED IN DEVELOPMENT,

		AGRICULTURE	FORESTS	RANGES	SOIL CONSERVATION
NATIONAL RESOURCES COMMITTEE		Coordinates Plans for Agriculture on Inter-departmental Level	Coordinates Plans for Forestry on Inter-departmental Level	Coordinates Plans for Range Use on Inter-departmental Level	Coordinates Plans for Soil Conservation on Inter-departmental Level
DEPARTMENT OF AGRICULTURE	BUREAU OF AGRICULTURAL ECONOMICS	Economic Research; Prepares General Plans for Agriculture	General Land Use Plans Including Forestry in Relation to Agriculture	General Land Use Plans Including Ranges in Relation to Agriculture	General Land Use Plans Including Soil Conservation in Relation to Agriculture
	SOIL CONSERVATION SERVICE	Soil & water Conservation. Water Facilities Development. Farm Forestry. Sub-marginal Land Purch.	Farm Forestry Demonstrations	Soil and Water Conservation on Ranges. Grass Restoration	National Program of Soil Conservation
	FOREST SERVICE	Farm Forestry Research. Grazing in National Forests. Forest Farming Program	Forestry Research. Adm. of National Forests. Coop. on State Nurseries & State & Priv. Forests	Range Research. Range Administration in National Forests	Soil Conservation in National Forests
	BIOLOGICAL SURVEY	Research & Technical Guidance to Aid Farm Programs which Promote Wildlife Cons. on Farms	Research & Technical Services to Forest Service for Wildlife Conservation in Forests	Technical Services for Wildlife Conservation on Range Lands. Rodent Control on Range Lands	Technical Services for Wildlife Conservation on Soil Conservation Projects
	AGRICULTURAL ADJUSTMENT ADMINISTRATION	Agricultural Conservation & Adjustment. Parity Payments. Commodity Loans.	Benefit Payments for Forestry Practices on Farms	Benefit Payments for Range Conservation	Benefit Payments for Soil Conservation
	FARM SECURITY ADMINISTRATION	Rural Rehabilitation and Relief. Tenancy Programs	Farm Plans for Tenants & Rehabilitation Clients Protect Farm Forests	Farm Plans for Rehabilitation Clients & Tenants Include Range Conservation	Farm Plans for Rehabilitation Clients & Tenants Include Soil Conservation
	EXTENSION SERVICE	Educational Work and Guidance in Agriculture	Educational Work and Guidance in Farm Forestry	Educational Work and Guidance in Range Practices	Educational Work and Guidance in Soil Conservation Practices
	BUREAU OF PLANT INDUSTRY	Plant Research and Introduction. Soil Research and Survey	Research in Forest Pathology	Range Plant Research	Basic Plant Research Needed in Soil Conservation
	BUREAU OF AGRICULTURAL CHEMISTRY AND ENGINEERING	Research in Agricultural Chemistry and Engineering, and in New Uses for Farm Products			
	BUREAU OF ANIMAL INDUSTRY	Livestock Research Disease Control Meat Inspection		Research in Animal Husbandry Contributes to Efficient Range Use	Research in Animal Husbandry Contributes to Efficient Soil Conserving Range Use
	BUREAU OF DAIRY INDUSTRY	Dairy Research		Research in Husbandry of Dairy Cattle Contributes to Efficient Range Use	Research in Dairy Cattle Husbandry Contributes to Efficient Soil Conserving Range Use
	BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE	Control of Insect Pests	Technical Services for Control of Forest Insects	Technical Services for Control of Range Insects	Control of Forage Depleting Insects Contributes to Soil Conservation
	OFFICE OF EXPERIMENT STATIONS	Coordination of Agricultural Research Grants to States Experimental Station	Coordination of Forest Research	Coordination of Range Research	Coordination of Soil Conservation Research
	WEATHER BUREAU	General Weather Services and Forecasts. Hydrologic Data			
	AGRICULTURAL MARKETING SERVICE	Marketing Research Service and Regulatory Work			
	FEDERAL SURPLUS COMMODITIES CORP.	Disposal of Surplus Agricultural Commodities			
	COMMODITIES EXCHANGE ADMINISTRATION	Regulation of Commodity Exchanges			
	SUGAR DIVISION	Control of Sugar Beet Production & Sugar Quotas Under Sugar Act, 1937			Joint Action with AAA for Conservation of Sugar Lands
	DIVISION OF MARKETING AND MARKETING AGREEMENTS	Agreements to Stabilize Marketing			
	FEDERAL CROP INSURANCE CORP.	Crop Insurance on Wheat			

[illegible]





The annual reports of the heads of the various land-use departments of government contain much valuable information about the development of federal land-use programs.

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